JANUARY 17, 1931

Railway Age

FOUNDED IN 1856

KERITE

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BEAVER FALLS, PA.

Another year added to the
PERFORMANCE RECORD OF KERITE

KERITE INSULATED WIRE & CABLE COMPANY
NEW YORK CHICAGO SAN FRANCISCO

"Are Some of the Ties in That Stack of 2's Oversize?"

"THAT question Mr. Blank is often asked by visitors on the *International* tie yard. You know the A.R.E.A. Specifications say that ***all thicknesses and widths apply to the sections of the tie between 20 and 40 inches from the middle of the tie***—the "rail-base" in other words. This part of the tie is subjected to the hardest wear; it is essential that it be strictly up to size there.

"Now here is a tie that is marked Size 2. It looks, as you say, large enough to be a 3. The rule shows that this end measures 6½" by 8¼". But measure the dimensions along the entire length of the rail-base! We find that in one place, here, the width is slightly less than 8 inches. Thus this tie must be graded down to Size 2, though it has almost the same value in the track as a No. 3."

Each *International* tie is carefully graded so that you are assured of getting in each one the full specification size unskimped in ***measure, manufacture*** or ***selection.***

You will find that *International* offers greatest tie value, actual tie for tie, and if you will come and see *International* ties we are content to let them do their own selling.

Allow us the opportunity of figuring with you on your 1931 requirements.

International

Creosoting & Construction Co.

General Offices: Galveston, Texas

Plants: Texarkana—Beaumont—Galveston

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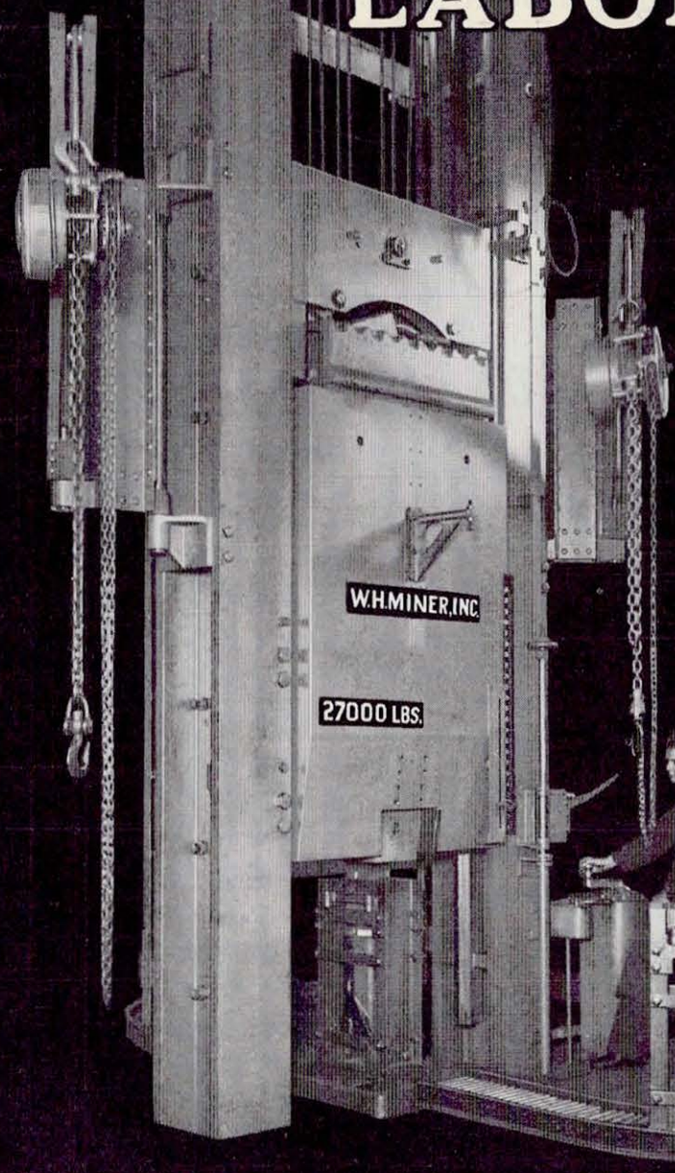
MINER

RESEARCH LABORATORY



Leadership in the science of shock prevention developed in this laboratory has resulted in the production of

UNEQUALLED DRAFT GEARS

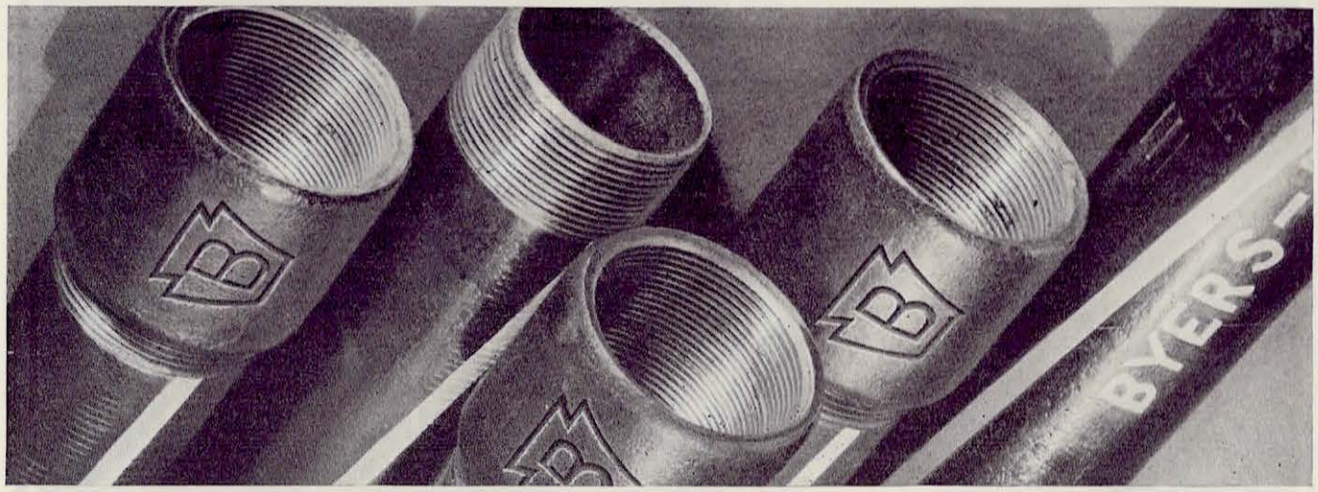
W. H. MINER, INC. CHICAGO

REPUTATION!

★ ★ ★

The "pipe prescription" that an engineer practices today creates the reputation he will have tomorrow. "Pipe prescription" is specifying the right pipe for the right place. Railroad "pipe prescription" is founded on actual service demon-

BYERS • GENUINE • WROUGHT-IRON PIPE



BYERS • GENUINE • WROUGHT-IRON PIPE

stration supported by laboratory tests. It is not a coincidence that railroads which maintain systematic records of the performance of materials are large users of Byers Genuine Wrought-Iron Pipe! A. M. Byers Company, Pittsburgh, Pa. Established 1864.

AN INVESTMENT—NOT AN OUTLAY

Published every Saturday by the Simmons-Boardman Publishing Company, 34 North Crystal Street, East Stroudsburg, Pa., with executive offices at 30 Church Street, New York

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Railway Age

With which are incorporated the Railway Review, the Railroad Gazette and the Railway Age-Gazette. Name Registered U. S. Patent Office.

Vol. 90 January 17, 1931 No. 3

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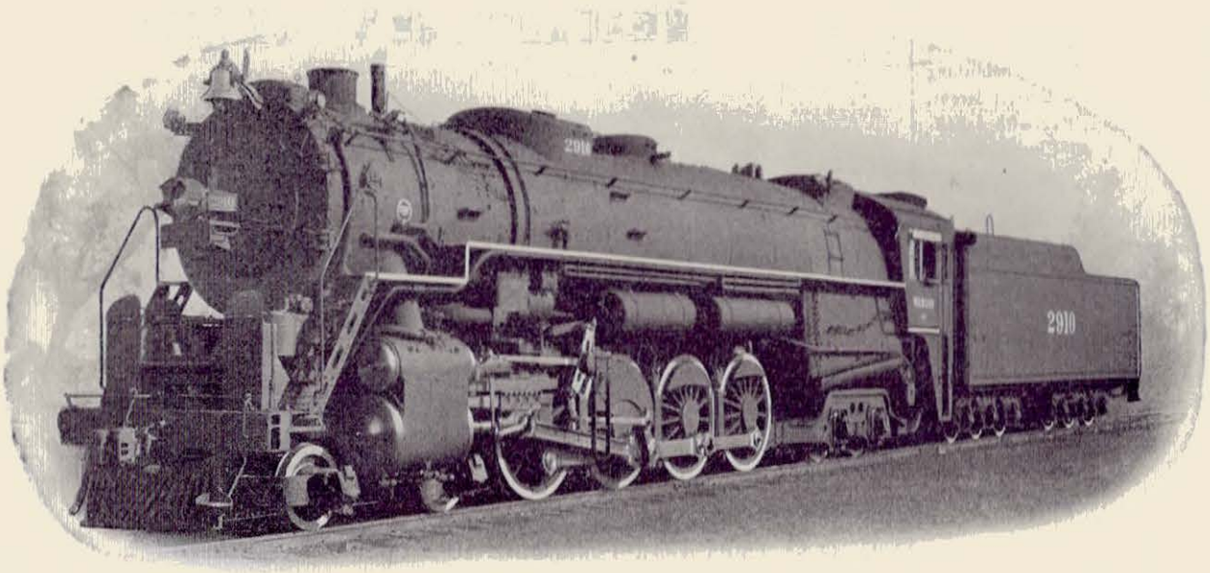


Present-day Traffic Demands Developed the Modern Locomotive

FOREMOST among the notable achievements of a century of locomotive designing and building is the efficiency which has been attained in the strictly modern type of locomotive.

This increased efficiency represents a marked advancement in the art of designing locomotives, and has been developed to meet present-day traffic demands.

From the standpoint of economy, the strictly modern type of locomotive, wherever introduced, has proved itself a most profitable investment for the railroads. As compared with the typical locomotive of 1910, it represents an increase in axle-load of approximately 20,000 pounds; an increase of 20,000 pounds in tractive force; a doubling of tender water capacity; 50 pounds higher steam pressure; 150 degrees increase in superheat; a reduction of 30 pounds in coal consumption per square foot of grate per hour, and a reduction of 10 per cent in steam consumption per indicated horse-power hour.

The use of such modern power is already resulting in improved train operation, heavier trains, increased speed, better service to shippers, less manual effort on the part of locomotive crews, less round house servicing, economies in the consumption of fuel and water, and a marked reduction in the cost of repairs.

With these great improvements now available, this seems to be the opportune time for the railroads of the country to begin a real replacement schedule, eliminating power which is costly to operate, and which cannot economically meet today's traffic demands.

In 1910, sixty per cent of the locomotives in use were less than ten years old. In 1915, the proportion of locomotives less than ten years old dropped to 50 per cent; in 1920, to 39 per cent; in 1925, to 28 per cent, and in 1929, to 21 per cent. If the average rate of replacement during the years 1925 to 1929 were maintained, it would require sixty-seven

THE BALDWIN LOCOMOTIVE WORKS ★ 1831 1931

years to turn over the entire inventory of locomotives in use today.

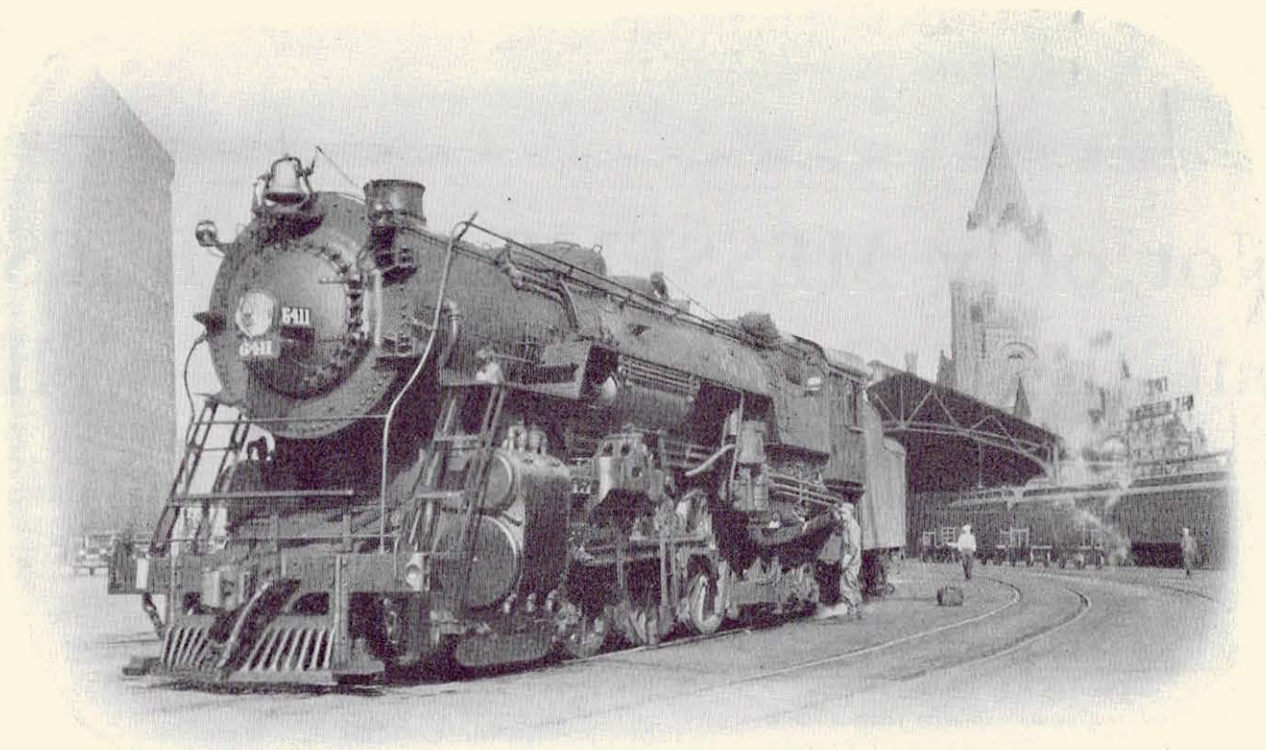
No locomotive more than ten years old can be regarded as strictly modern. In spite of the relatively small proportion of such power in service, it is significant that, in 1921, locomotives operated by Class I roads consumed, in freight service, an average of 162 pounds of coal per 1000 gross ton-miles, including locomotive and tender, while in 1929, the amount was only 125 pounds—a reduction of 23 per cent.

These figures indicate not only the remarkable savings that have been effected by the most modern type of power, but also the added savings that could be realized were the entire locomotive inventory kept up-to-date.

During the years 1926 to 1928, the annual locomotive repair bill averaged $435,000,000, or about seven times the amount charged against depreciation and retirement. By increasing the latter item and transferring part of the repair charge to the purchase of new power, the standard of efficiency would be raised, operating expenses would be reduced more than capital charges would be increased, and the railroads would be able to take advantage of the latest improvements in locomotive design. This is quite as true of the comparatively light power used on branch lines and local runs, as it is of the heaviest types designed for main line service.

A modern locomotive is one best fitted to meet any given railroad traffic requirements as they exist today, and therefore, in determining whether a locomotive is up-to-date or not, size is an immaterial factor.

The locomotives illustrated represent strictly modern types—such as will be needed if the railroads are to adequately meet the traffic demands of today and tomorrow.



THE BALDWIN LOCOMOTIVE WORKS

PHILADELPHIA

ANACONDA
from mine to consumer
REG. U.S. PAT. OFF.

Not only MESSENGER CABLES but these Other Products as well

★ Mills ● Offices

Anaconda safeguards quality from mine to consumer—provides a nation-wide service, prompt, dependable, complete.

Signal Wire . . . Control Cable . . . Telephone and Telegraph Cables . . . Trolley Wire . . . Rail Bonds . . . Rubber-Covered Wire . . . Power Cable . . . Weather-proof Wire . . . Magnet Wire . . . Parkway Cable . . . Heavy-Duty Portable Cords . . . Annunciator and Office Wire . . . Duratube . . . Flexible Conduit . . . *Wires and Cables for every Electrical Requirement.*

ANACONDA WIRE AND CABLE COMPANY

General Offices: 25 Broadway, New York · · · *Chicago Office:* 20 North Wacker Drive

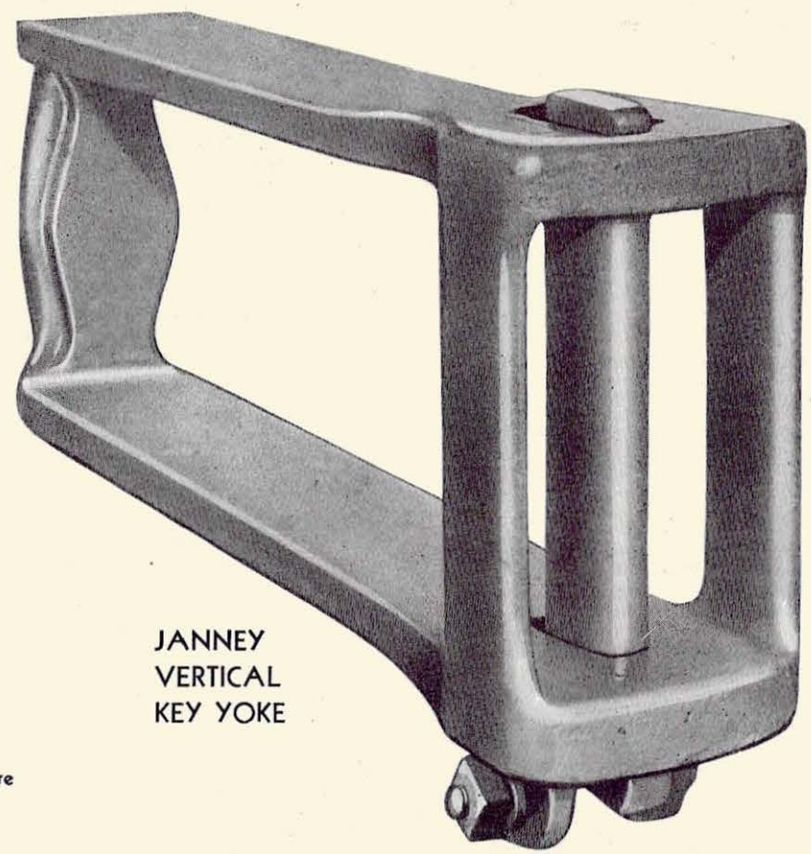
Sales Offices in Principal Cities

YOKE MAINTENANCE

14 MONTHS was found by one railroad to be the life of yoke rivets. Their replacements necessitated 10 distinct operations before the car was again in good order.

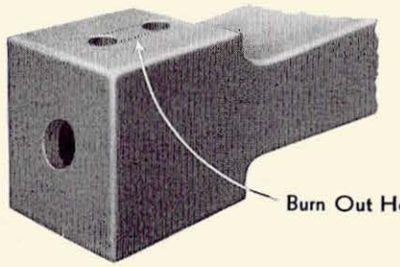
Many roads have eliminated yoke maintenance by the application of Janney Vertical Key Yokes. This yoke can be used without change to existing center sill construction and does not even require new couplers, while it does provide a satisfactory flexible connection between couplers and draft gears.

Railroads have bought large numbers of Janney Vertical Key Yokes and most of these have gone to replace riveted yokes, eliminating what previously had been a considerable item of maintenance.



JANNEY
VERTICAL
KEY YOKE

Used with old couplers



AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO ST. LOUIS

Real passenger comfort, lower operating costs...

with this light-weight insulation

IN 1929, a very large portion of America's new passenger cars were insulated with Balsam-Wool!

Transportation officials have found that Balsam-Wool assures true passenger comfort.

It keeps cars cool in summer, warm in winter. It absorbs much of the noise of rapid transportation . . . creates passenger comfort.

Flexible—it tucks into hard-to-fit places.

Highly *efficient. Permanent*—cannot rot, sift or settle.

In addition, its *light weight* means lower operating costs.

Reinforced with a special protective fabric and asbestos covering, *fire-safe,* it resists the wear of nail caps and bands.

It meets all the requirements for railway mail cars.

The average thermal conductivity of Balsam-Wool does not exceed 6.0 B.t.u. per inch thickness, per square foot, per one degree Fahrenheit temperature difference in 24 hours. One-inch Balsam-Wool weighs only about 50 lbs. per 100 square feet

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Mills at Cloquet, Minnesota

Railroad Sales Offices: Chicago, 360 N. Michigan Ave.
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THICK . . . FLEXIBLE INSULATION . . . EFFICIENT

Manufacturers of the Balsam-Wool line of Industrial Insulations for Refrigerator Cars, Passenger Cars, Motor Buses, Airplanes, Domestic Refrigerators. Also makers of Balsam-Wool Standard Building Insulation and Nu-Wood Insulating Board

IN HIGH PRESSURE STEAM ENGINES...

NICKEL CAST IRON RINGS PERFORM BETTER LONGER!

Nickel Cast Iron piston ring for high pressure steam engine mfd. by TRINITY VALLEY IRON & STEEL CO., Fort Worth, Texas

IN STEAM ENGINES, as in internal combustion engines, Nickel Cast Iron plays an important part in securing improved performance. Nickel Cast Iron rings, ranging in size from ½ to 1½ inches in thickness and containing from 1.0 per cent Nickel in smaller rings to 2.25 per cent Nickel in larger sizes, are daily demonstrating their ability to reduce operating costs and delays.

Improved wear-resistance, good flexibility and greater strength are characteristics of these Nickel Iron rings. In addition, they also possess ready machinability, close grain and take a high polish... factors that are obviously essential in securing better compression in gas, oil and high pressure steam engines.

For today's exacting service leading manufacturers know that ordinary cast iron cannot meet all modern requirements ...The times demand Nickel Cast Iron, because this scientifically correct material "performs better longer"!

THE INTERNATIONAL NICKEL COMPANY, INC.

Miners, refiners and rollers of Nickel . . . Sole producers of Monel Metal

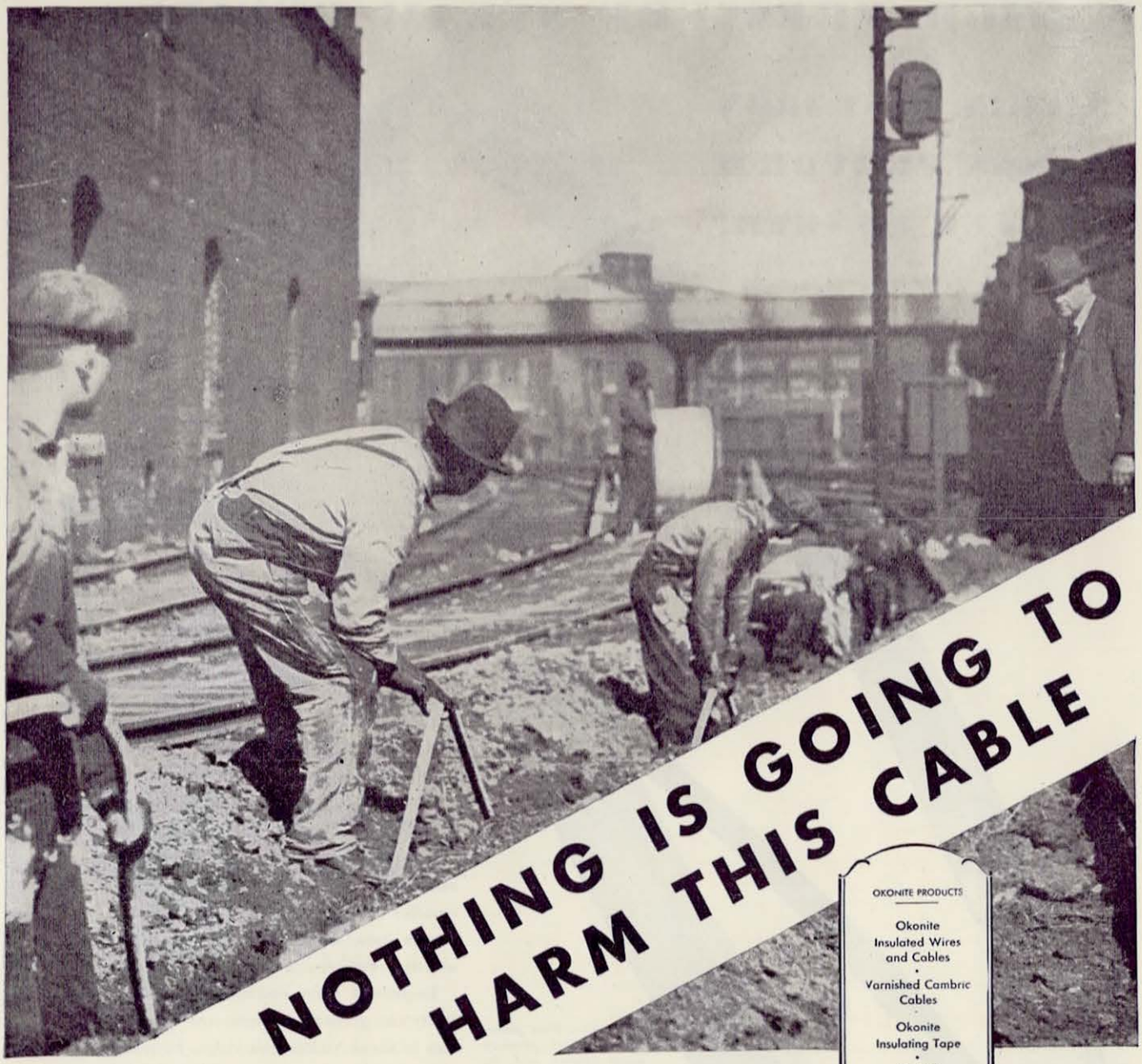
67 Wall Street New York, N. Y.

OUR CASTING SPECIALISTS WILL GLADLY DISCUSS YOUR PROBLEMS WITH YOU

INCO NICKEL

Nickel CAST IRON

A BETTER MATERIAL FOR MODERN NEEDS



NOTHING IS GOING TO HARM THIS CABLE

SIGNAL circuits enclosed within the protecting sheaths of OKONITE Lead and Steel-Taped Cable are buried directly in the ground beside the right of way. There they will remain secure from harm. Dragging, equipment and derailments will not break them. Water, dirt and car drippings cannot leak in to destroy the insulation. The impregnated wrappings are proof against soil corrosion.

Nothing is going to harm this cable and no money need be spent to maintain it. OKONITE Lead and Steel-Taped Cable makes the most economical form of signal circuit installation ever devised for railway signal work.

OKONITE PRODUCTS

Okonite Insulated Wires and Cables

Varnished Cambric Cables

Okonite Insulating Tape

Manson Friction Tape

Okocord

Okoloom

OKONITE-CALLENDER PRODUCTS

Impregnated Paper Cables

Super-tension Cables

Splicing Materials

THE OKONITE COMPANY

Founded 1878

THE OKONITE-CALLENDER CABLE COMPANY, INC.

Factories: Passaic, N. J. Paterson, N. J.

SALES OFFICES:

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ST. LOUIS ATLANTA BIRMINGHAM SAN FRANCISCO
LOS ANGELES SEATTLE DALLAS

General Electric Supply Corp. Boston, Mass.

Canadian Representatives: Engineering Materials, Limited, Montreal

A striking example of the importance and efficiency of Armco Perforated Pipe. Station tracks at Alexandria, Louisiana, where Armco Perforated Pipe is installed under the track to the left of the platform. The righthand track is undrained.

Smoother Travel, Safer Travel where ARMCO *Perforated* PIPE Drains the Roadbed

And great economy! Safety, founded upon smooth tracks over a firm, dry roadbed, demands the thorough drainage provided by Armco Perforated Pipe. Many railroads have found this long-lasting, pure iron pipe to be the most efficient—the most dependable they can install.

More than safe, Armco Perforated Pipe carries off water so well that its use is a distinct economy. It reduces track and roadbed maintenance costs to a marked extent.

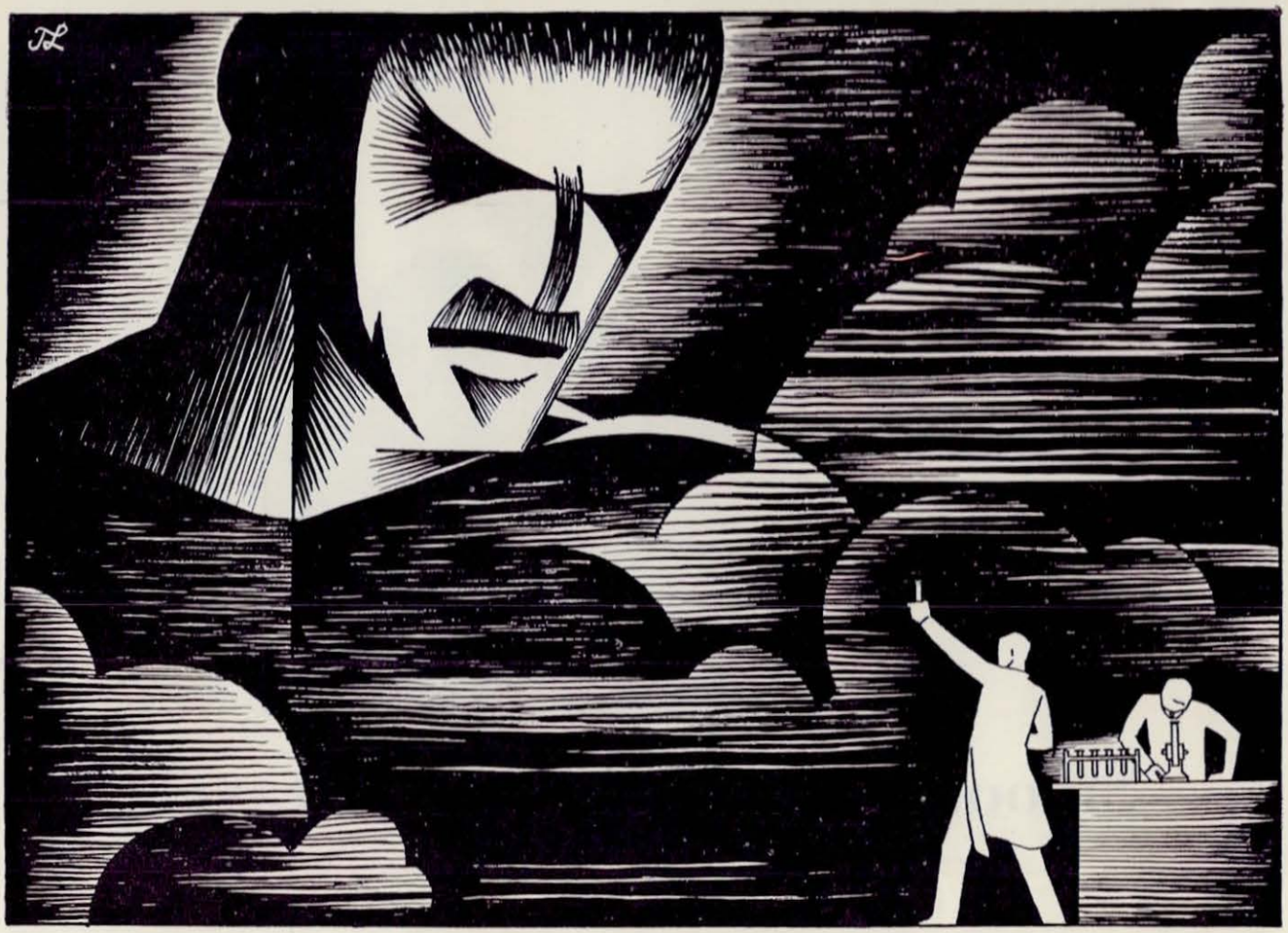
Armco research and field studies produced this remarkable pipe to meet a specific need. Continued research and field studies prove its superiority. Users, countrywide, testify to this. The 25-year unequalled record of durability of Armco Corrugated Pipe offers added testimony to the good judgment of those who specify or buy it.

Factual data on Armco Perforated Pipe in use throughout the country under all conditions, will be sent on request.

Armco culverts and drains are manufactured from the Armco Ingot Iron of the American Rolling Mill Company and always bear its brand.

ARMCO CULVERT MANUFACTURERS ASSOCIATION

Middletown, Ohio



JUMP INTO THIS

Too big and too tough to be captured in the test tubes of scientists is Time, that truthful old tester of everything in this world. Again and again he laughs at . . . and upsets . . . the calculations of those who try to judge the length of life of pipe by accelerated methods.

No laboratory walls can hold . . . no instruments can measure . . . the multitude of mighty forces which Time commands in the tests of ACTUAL SERVICE. That's why leading engineers agree that the only true measure of pipe longevity is life.

In the tests of Time, Reading Genuine *Puddled* Wrought Iron Pipe has proved beyond question its longer life; Reading 5-Point Pipe installed twenty . . . thirty . . . forty and more years ago is still good today! Buy the pipe that Time has *fully* tested—you are *sure* of pipe dependability with Reading Genuine *Puddled* Wrought Iron Pipe.

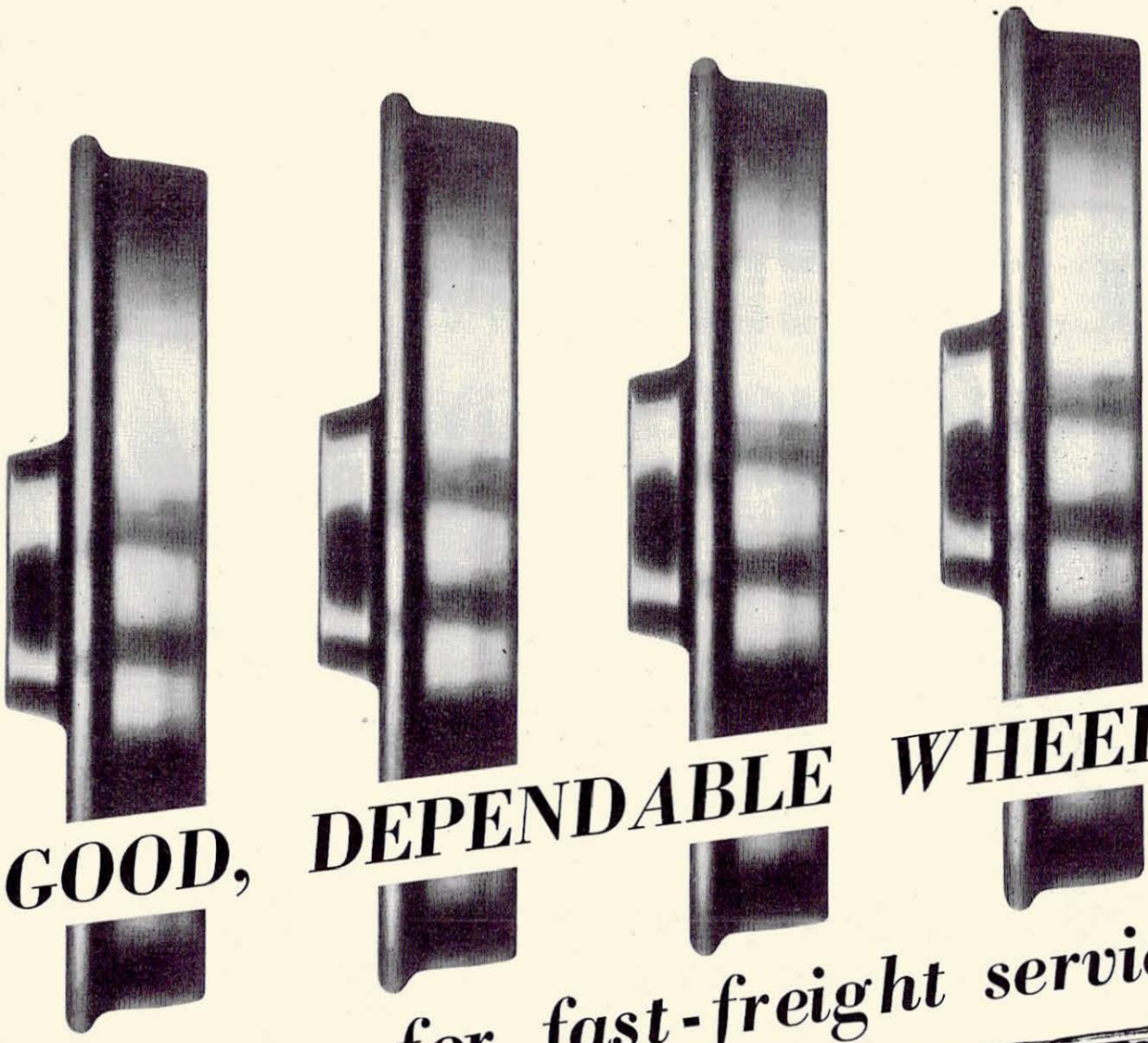
Use only Reading 5-Point Nipples with Reading 5-Point Pipe . . . you'll know them by the indented spiral band.

READING IRON COMPANY, Reading, Pennsylvania

For Your Protection, This Indented Spiral Forever Marks All READING PIPE

GENUINE PUDDLED WROUGHT IRON
READING · PIPE
DIAMETERS RANGING FROM ⅛ TO 24 INCHES

Science and Invention Have Never Found a Satisfactory Substitute for Genuine Puddled Wrought Iron



GOOD, DEPENDABLE WHEELS

for fast-freight service

Due to the ever-increasing demands of modern business, faster and longer freight trains have become, not the exception, but the rule. As a result, greater and greater burdens are placed on the wheels.

Small wonder that railroad executives everywhere are laying stress on the importance of good, dependable car wheels!

Bethlehem Light Weight Wrought Steel Wheels meet all the requirements of today's fast-freight service. They are strong, safe, and durable. These light-weight wheels are produced for all types of freight cars, up to and including those of 70 tons carrying capacity. They are made by the same process as multiple-wear Bethlehem Wheels but have smaller hubs, and lighter plates and rims than the corresponding wheels of the multiple-wear type.

The long, satisfactory service that they give and their economy and safety, make Bethlehem Light Weight Wrought Steel Wheels the logical wheels for modern fast-freight service. We invite you to make a thorough investigation of their many advantages.

BETHLEHEM STEEL COMPANY
General Offices: Bethlehem, Pa.

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BETHLEHEM
Wrought Steel Wheels

Commonwealth

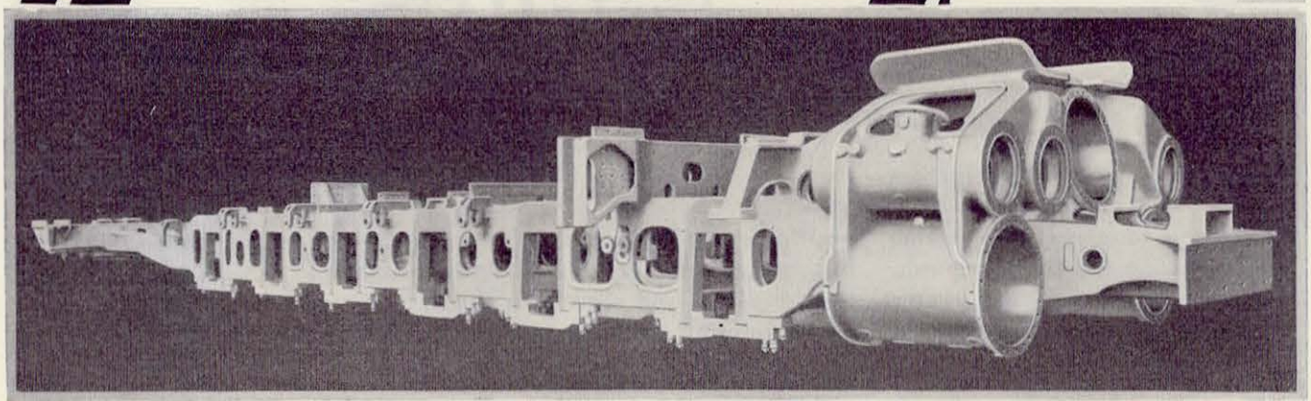
LOCOMOTIVE BED *with* INTEGRAL CYLINDERS

Combining the Main Frames, Cylinders, Cradle, Deck Casting and all Crossties into a Single Steel Casting. Eliminates Hundreds of Machined Bolts, Nuts, and Miscellaneous Parts and Greatly Simplifies the Construction of the Locomotive.

INCREASED STRENGTH

MAINTAINANCE GREATLY REDUCED

A MASTERPIECE IN CAST STEEL



THREE CYLINDER TYPE

MORE THAN ONE THOUSAND LOCOMOTIVES EQUIPPED WITH BEDS NOW IN SERVICE!

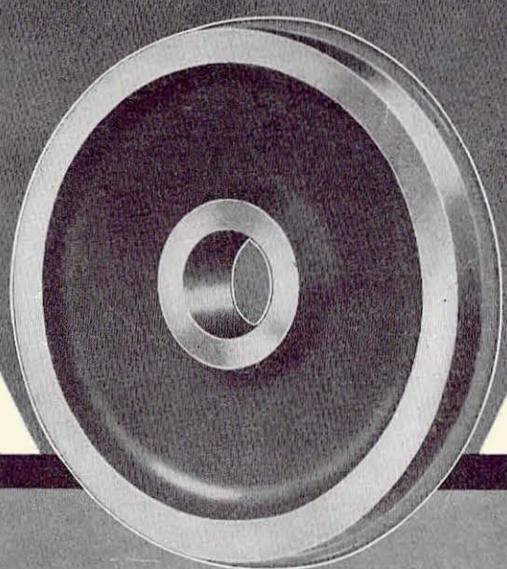
GENERAL STEEL CASTINGS CORP.

GRANITE CITY, ILL. *EDDYSTONE, PENN.*

EDGEWATER

ROLLED STEEL
WHEELS

LOCOMOTIVE
& CAR WHEEL
TIRES



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PITTSBURGH, PA.

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St. Paul, Minn., Merchants Bank Bldg.
Seattle, Wash., 2929 First Ave. South
Portland, Ore. 114 North 16th St.
Baltimore, Md., Munsey Bldg.
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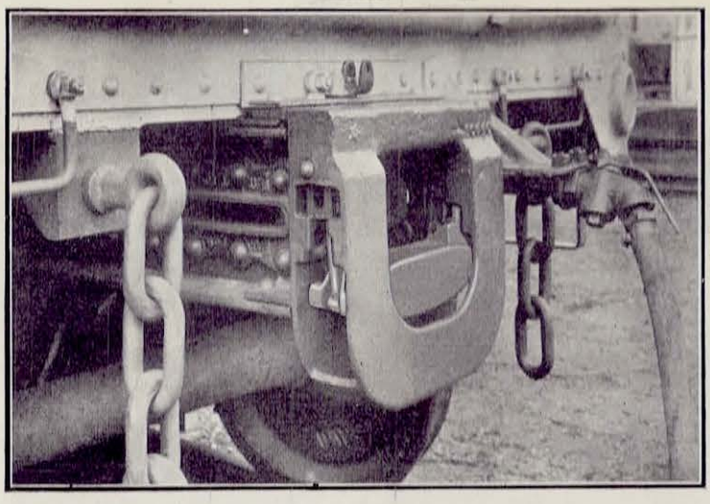
San Francisco, Cal., 540 Brannan St.
Washington, D. C., Munsey Bldg.
Philadelphia, Pa., Liberty Bldg.
Chicago, Ill., Peoples Gas Bldg.
Atlanta, Ga. Candler Bldg.

E



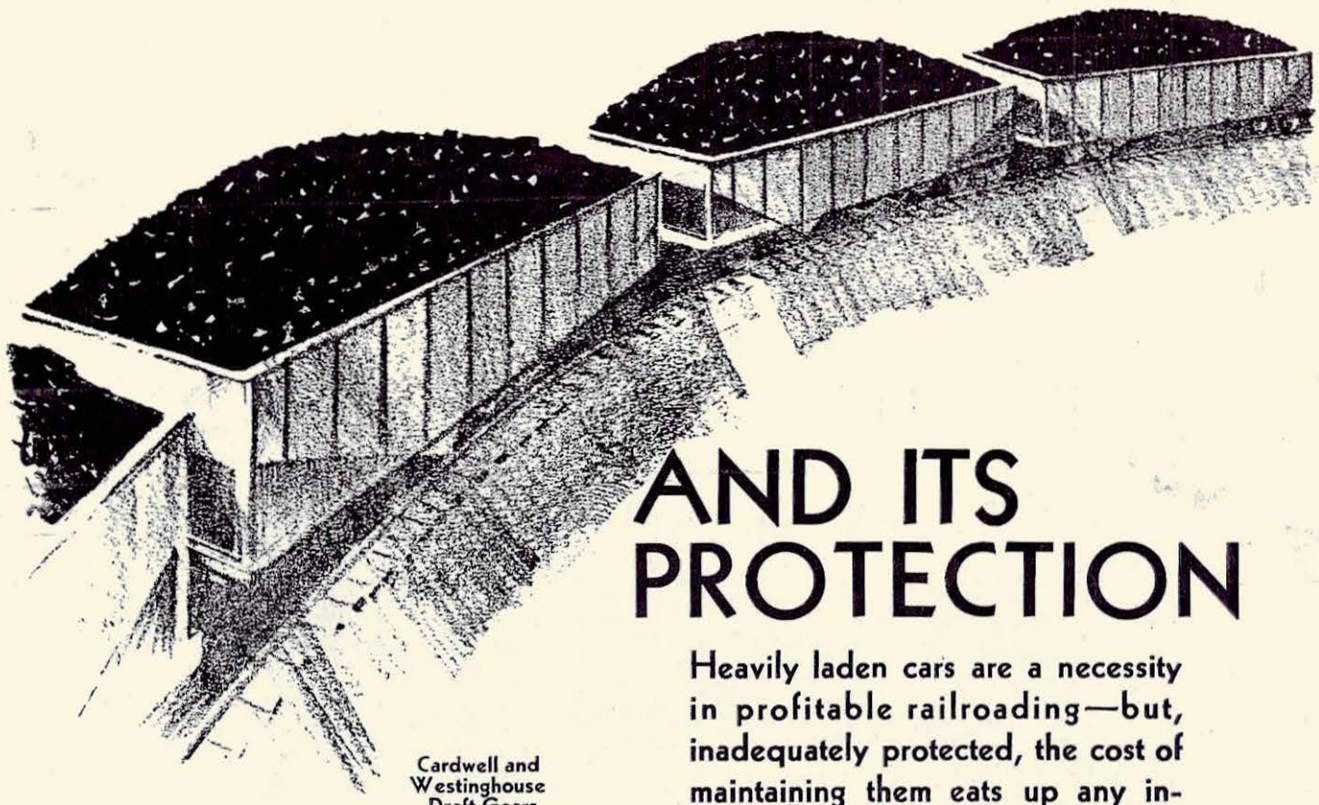
Advantageous Substitution

Bolts, nuts, pins and cotters have their uses, but where the same functions can be performed by one piece which cannot become lost, an advantage is obtained. The carry iron of the Union Centering Device is supported on reversible drop forged links, alike at both ends and interchangeable with each other.

Union Metal Products Company

New York Chicago
Kansas City Washington
St. Louis Houston
San Francisco
Richmond
Montreal

HEAVY LADING — — —



AND ITS PROTECTION

Heavily laden cars are a necessity in profitable railroading—but, inadequately protected, the cost of maintaining them eats up any increased revenue they might have earned.

Provide the needed protection by replacing inadequate draft gears with the new Cardwell and Westinghouse Draft Gears.

Cardwell and Westinghouse Draft Gears

Are made in sizes and capacities to meet all modern and A. R. A. requirements for locomotives, freight and passenger cars.

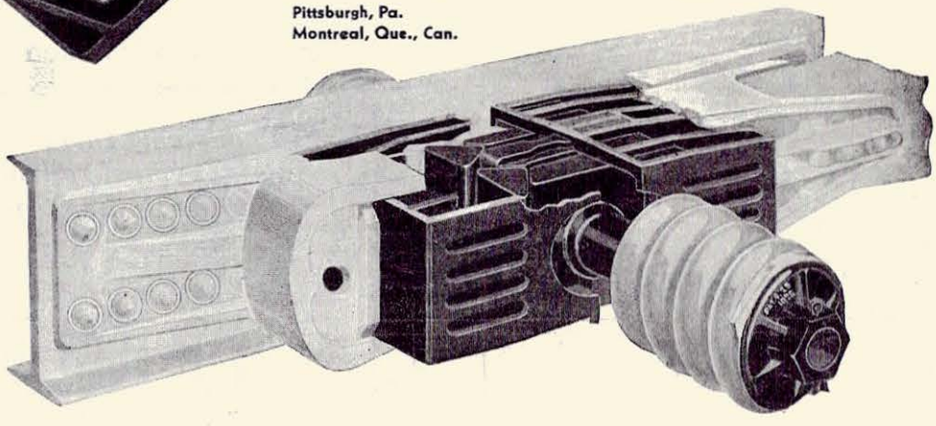
Westinghouse NY-11-D Friction Draft Gear

Westinghouse Draft Gears can be applied with any type of attachments.

CARDWELL WESTINGHOUSE COMPANY

332 S. Michigan Ave. Chicago, Illinois

Pittsburgh, Pa.
Montreal, Que., Can.

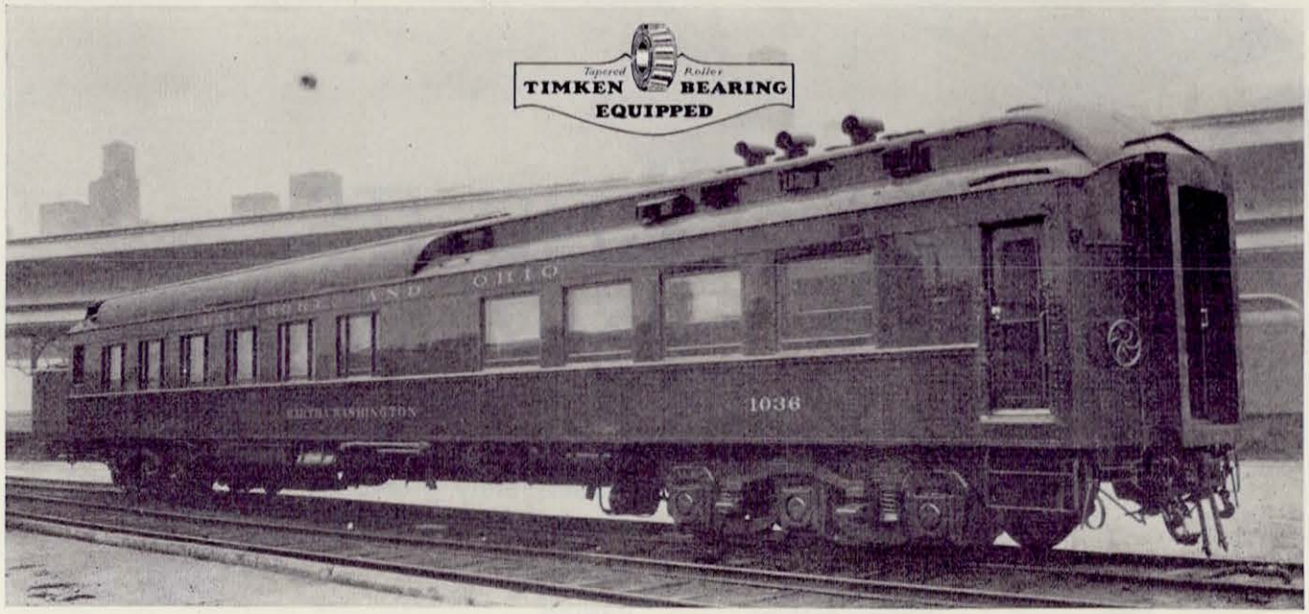


Cardwell L-25 Friction Draft Gear

Cardwell Gears are made to fit any length of yoke or draft-gear pocket.

GREATER PROTECTION INSURES A REDUCTION IN CAR MAINTENANCE AND DAMAGED-LADING COSTS

The "Martha Washington" *Is* Timken Bearing Equipped



Cooled air ventilation and Timken Bearings make this latest enterprise of The Baltimore & Ohio Railroad a revelation in modern dining car comfort.

By means of the ventilation system, the car is kept pleasantly cool in the hottest weather, while with Timken Bearings in the trucks it is insulated against the jolts and jars of stopping and starting.

But smooth, steady running is only one of the advantages which Timkens confer on passenger cars of all types.

Of equal importance are the elimination of hot boxes, the lubrication economies and radically reduced maintenance costs resulting from Timken tapered construction and Timken-made steel.

That's why there are more Timken Bearings used by the railroads of the United States than any other type of anti-friction bearing.

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WE leave no stone unturned to assure the longer life, greater dependability and lower maintenance cost of locomotive and car wheels, tires and forgings made of "Standard" steel. We control in our own plant all the operations and processes of manufacture from raw material to the completed product. This includes the making of the steel, the cooling and solidification of the billet, the forging of the billet, and the reforging, heat treatment and final exact machining and testing. Only in this way can we be sure that all "Standard" parts are worthy of the name and the confidence they enjoy with their many eminent and satisfied users.

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EARNING REVENUE -AN ASSET

CARS earn money only when they are hauling freight. Cars on the rip track waiting for roof repairs not only eat up the interest on their investment but create an additional expense.

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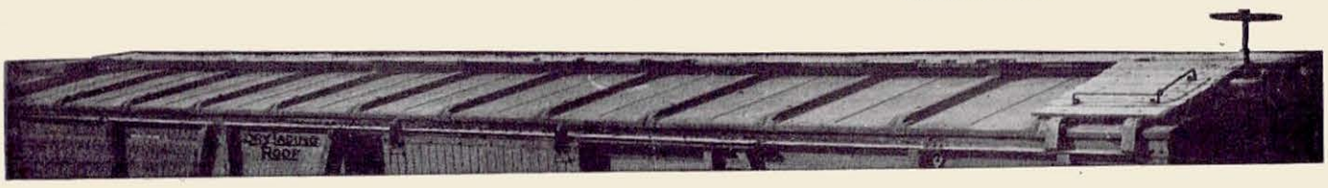
If you adopt the Universal roof, ***you save money***. There is no standing time loss of revenue, no delays to transportation, no big stock of roofs necessary. The Universal roof consists of only nine parts, which are adjustable and will make a weatherproof roof on any size or design of car.

Speeding up car repairs is only one of a thousand different reasons why the Universal Roof is the outstanding improvement in car construction history.

HUTCHINS CAR ROOFING COMPANY
DETROIT MICHIGAN
Established 1880



RAILWAY AGE

The Railways and Highway Transport

The National Association of Motor Bus Operators recently issued a bulletin entitled, "Rail Propaganda for Increased Taxation and Regulation of Highway Transport." In this bulletin the declaration of policy adopted by the Association of Railway Executives in November was discussed and it was announced that "the automotive industry is prepared to fight," and that a general educational and publicity campaign will immediately be started to prevent legislation that would increase the regulation and taxation of motor coaches and trucks using the public highways.

"As soon as the public understands," says this bulletin, "that the real intent of the railroads is to increase the cost of highway transportation to the level of rail costs, regardless of the necessity therefor, it can be expected that the automotive groups will be joined by other organized groups in their campaign against the railroad program. To increase the cost of one form of transportation merely to protect the revenues of another form of transportation is one of the most peculiar premises that has ever been put forward in an argument for the increased taxation and regulation of a public utility."

Elsewhere it is said in the same bulletin, "The cry of most transportation economists and government officials for the past ten years has been for co-ordination of highway, waterway and rail service to bring about cheaper and better transportation for the public, yet, with few exceptions, the railroads, which are supposed to be in hearty accord with this movement, have done everything possible to hinder and prevent co-ordination of these facilities."

Now, what are the conditions actually existing, and what policies are the railways actually trying to get adopted?

Disregarding the interests of the railways themselves, it is generally conceded that it is essential to the public welfare that they shall continue for many years to give good and adequate service, and that they cannot do so without adequate earnings. Without any intention or expectation that the result would be to threaten the earning capacity and service of the railways, the public has spent many billions of dollars in the construction of hard-surface highways. Unexpectedly, these highways have come to be extensively used by operators of motor buses and trucks of capacity so great that they have become very effective competitors of the railways, not for only short haul, but also for long haul traffic, both passenger and freight.

Co-ordination and Competition

Co-ordination of railway and highway transport is one thing. Competition of railway and highway transport is another thing. Co-ordination resulting in each means of transportation handling that traffic which it is best fitted to handle well and economically is in the public interest. Nobody questions that motor trucks rather than railways should handle a great deal of short haul freight business. Apparently it will not be long until the railways will quite generally establish store door collection and delivery of freight and themselves acquire and use a great many motor trucks in rendering this service. This is real co-ordination of railway and motor transport.

When, however, motor coaches and trucks engage, as they have engaged, in carrying both passengers and freight long distances in competition with the railways, some widely different questions are raised.

What effect does this have upon railway earnings? That is a question which concerns the public, because the public needs good railway service, and it cannot be provided without adequate railway earnings. Why are motor buses and trucks able to take so much long distance traffic from the railways? This question immediately calls attention to two outstanding facts. The first is, that the railways use highways that they have provided and maintained at the cost of their owners, while the motor buses and trucks use highways that have been provided and are maintained by the public. The second is that the railways are subjected to much regulation of their rates and service to which carriers by highway are not subjected.

Now, obviously, when the railways must pay the interest and maintenance costs of their highways and taxes upon the investment in them, competition between them and motor buses and trucks can not be equal unless and until the motor buses and trucks pay to the public for the use of public highways amounts equivalent to the interest and maintenance costs that

their use of the highways renders it necessary for the public, including private motorists, to pay. "Studies are now under way," says the National Association of Motor Bus Operators, "the results of which will conclusively prove the fact that the automotive vehicle is paying its own highway bill, with the proper share, according to use, being paid by each type of vehicle." If this is proved the railways' claim that motor buses and trucks are not paying adequately for the use of the highways will be disproved. There are, however, wide variations from state to state in the amounts paid by motor buses and trucks for the use of the highways and the claim of the motor bus operators as to what can and will be proved may well be regarded with skepticism until the proof is forthcoming.

The motor bus operators also say in their recent bulletin that it will be conclusively proved that each type of motor vehicle "is being adequately regulated from every standpoint in every state in the country." This statement, of course, raises immediately the question as to what is "adequate regulation." Motor buses and trucks are not regulated in the same way as the railways with which they compete. They can make and change their rates as they like, while the railways are hampered by requirements that they shall publish all their rates, that they shall charge only their published rates, that they shall change them only after due legal notice, that they shall charge no lower rates for longer than for shorter hauls without government permission, and that in making rates they shall practice no discriminations between shippers and communities that government authority holds unfair.

Furthermore, once the railways have established a service they must continue it even at a loss until authorized by public authority to withdraw it, while motor buses and trucks can appear upon the scene when conditions are favorable and take large amounts of traffic, and then withdraw their service when conditions, from their standpoint, become unfavorable.

Motor Transport Will Stay

Is this fair to the railways, or in the public interest, and are their competitors "adequately regulated," when these competitors are left thus free, while the railways are thus shackled? Some reply that the railways also should be freed. The trouble with that answer is, that there is no public sentiment whatever in favor of freeing the railways and no prospect that they will be freed. Furthermore, to free them from regulation would not give them fair play as long as their competitors were subsidized. Therefore, in the interest of fair play and the public welfare, the railways ask that their competitors shall be treated as they are. It is significant that no one has yet undertaken to show it would be fair or in the public interest to continue present differences between the treatment accorded the railways and other means of transportation, and an argument in which this was attempted would be an interesting document.

The railways are not, as is now often charged, trying to destroy other kinds of transportation. They know that motor bus and truck transportation has come to stay, and that it would be contrary to the public interest to destroy it. They do not believe, however, that even their own motor buses and trucks should be given subsidies and freedom from regulation that their rail lines do not enjoy, because the result would be to divert from their rail lines to their motor buses and trucks much traffic which, on sound economic principles and in the public interest, should be handled by rail. As to motor buses and trucks owned and operated by independent companies, the railways demand that they shall be deprived of all the unfair advantages they now enjoy owing to government policies, because they regard it as not only unfair, but as contrary to the public interest, that one means of transportation should take traffic and earnings from another which it could not take if it were not aided by the national and state governments with their power of regulation and with money collected by them from the tax-paying public.

Propaganda against the policies being advocated by the railways is to be welcomed because it will increase public interest in the issues presented, and thereby cause the public more earnestly and intelligently to consider the present railway situation, its causes and remedies. The railroad problem cannot be solved under private ownership and management without radical changes in present government transportation policies. The more the problem is discussed from every angle the more probable will be a solution of it that will be in the interest of railway owners, employees and the public.

Co-operative Engine Runs

After a number of years of experimentation and practical demonstration, the economic value of long engine runs has come to be an accepted fact. Throughout the country, almost every railway has developed the practice along efficient lines, adapted to the operating conditions in its territory. The theory that it is necessary to change engines every time the engine crew is changed, or perhaps oftener, is no longer accepted, and assigned engines, which, under former operating conditions, had much to commend them, have practically passed out of the picture. Few lines still use assigned engines, and most of these are continuing the practice because of unusual operating conditions.

In the West, where in many cases engine terminals were originally established primarily because of mileage considerations, it was of frequent occurrence that a terminal handled the locomotives of through trains only, with the possible addition of a way-freight locomotive. These terminals were situated in towns having no local industries requiring the services of switching engines, and, manifestly, there was an immediate and apparent saving in the closing of such terminals by running en-

gines through. On one such road it has been possible to eliminate 14 of these terminals by the inauguration of long engine runs. In the East such terminals were by no means as common as in the West, for in the heavily industrialized areas it was rare to have an engine terminal serving through trains that did not also take care of a number of switching engines. However, within certain limitations, the eastern roads have also found long engine runs profitable, for while few enginehouses could be closed entirely, the reduction in expenses brought about by the decrease in the number of engine dispatchments has provided ample justification for the extension of the practice.

The adoption of long engine runs is still capable of considerable expansion, and as the operating problems are worked out extensions of runs will continue for years. Some railways are now asking why they should confine long engine runs to the limits of one railroad. There seems to be no good reason why, under favorable circumstances, locomotives should not be run through over more than one railroad. For a number of years the Reading, in connection with the Western Maryland, has had a joint long engine run plan in effect for its coal traffic, and, in connection with the Pennsylvania, for both freight and passenger traffic. The results have been entirely satisfactory. Within recent weeks the Boston & Maine has established through passenger engine runs between Boston and Montreal in connection with the Central Vermont via White River Junction, and also with the Canadian Pacific via Wells River. Preliminary studies and the brief period of actual operation, forecast attractive savings by this plan. There are other runs throughout the country on which the plan might be used to advantage.

Railway Taxes

On looking at the railways' income account for 1930, one wonders whether our state and local taxing authorities realize that there has been a business depression. If this realization actually exists it was certainly not acted upon, as railway taxes in the year just ended consumed a higher proportion of railway revenues than ever before in history.

Railway taxes in 1930 are estimated at $356,000,000, a reduction of $46,000,000, or 11 per cent, below the peak 1929 total of $402,000,000. This reduction was principally due, of course, to the fact that federal taxes are income taxes, falling as income falls. This 11 per cent reduction in taxes, however, was accompanied by a drop of 16 per cent in railway gross revenues, so relatively the railways' tax burden was the heaviest which they have ever borne.

Taxes in 1930 took 6.6 cents out of every dollar of revenue received by the steam lines. The corresponding proportion paid in 1929 was 6.3 cents, and the peak, prior to 1930, was 6.4 cents, paid in 1928. Tracing the growth of railway taxation back by decades, the proportion of railway revenues consumed by taxes amounted to 4.4 per cent in 1920, 3.5 per cent in 1910, 3 per cent in 1900, and 2.8 per cent in 1890. It is a far cry from this figure to the 6.6 per cent paid in 1930.

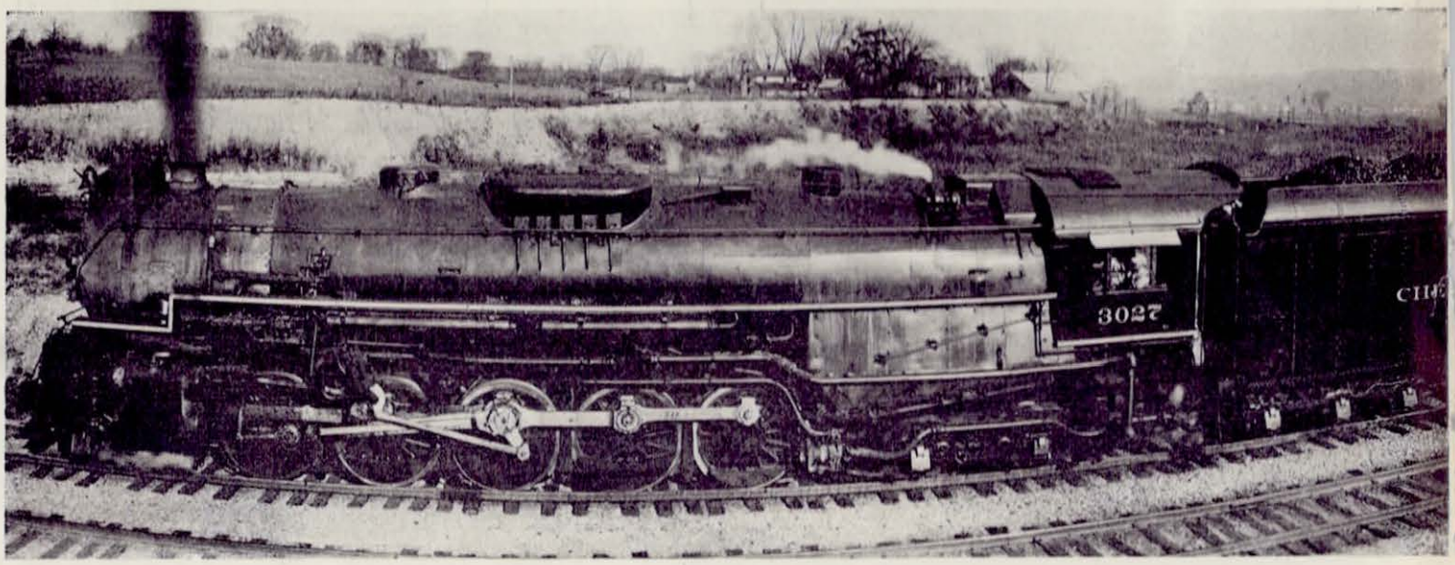
Taxes in 1930 took approximately 26 per cent of net revenue. In other words, on the average, more than one-quarter of the entire railroad network of the United States was operated for the sole benefit of the tax collector.

Real Relief of Unemployment

Official measures for the relief of unemployment consist mainly in expenditures for public works. Since relief is necessary and public works are necessary, and can be carried out at any time regardless of business considerations, it is wise and humane that they be especially emphasized at times like the present.

At the same time, it must not be overlooked that no amount of such activity by the government can be anything but a palliative. It is to private industry that the country must look for a return of real prosperity. Indeed it is quite possible to imagine public works expenditure on such a scale that it might sap the taxpayers and lessen confidence in the future of general business. It follows that our lawmakers would contribute far more to a reestablishment of business confidence and a return of prosperity by acts calculated to encourage private initiative and industry than they can ever hope to do by authorizing schemes for public works, on however large a scale.

The railways represent an investment of 25 billion dollars and almost everyone in the country directly or indirectly has a share in this investment. Likewise millions of persons depend either directly or indirectly on the railways as a means of livelihood. This great industry is now depressed, not only along with business generally, but still further because of the growth of competitive means of transport, aided, to a large extent unwittingly, by the taxpayers. A threat of the safety of such a tremendous investment, so widely held, is alone sufficient to account in considerable degree for prevalent business uncertainty. Conversely, the promise of an early solution to this difficulty—and end to the dangers of unnatural competition endangering this investment—would probably afford a powerful impetus to the return of general business confidence. This in the long run is the real solution to the problem of unemployment. Let us by no means neglect relief measures, but at the same time in the press of the multitude of such proposals, let us not overlook the fact that it is reasonably prosperous private enterprise which must be the ultimate goal.



C. & O. 2-10-4 Type Locomotive Hauling a Train between Russell, Ky., and Walbridge, Ohio

C. & O. Runs Road Tests on 2-10-4 Locomotives

Powerful two-cylinder ten-coupled locomotives purchased after exhaustive road tests against Mallet and 2-8-4 types

IN September of this year the Chesapeake & Ohio place in regular service the first of 40 locomotives of the 2-10-4 type, which were built to handle 11,000-ton trains on 0.2 per cent grades.* These locomotives are being used between Russell, Ky., and Toledo, Ohio.

About 80 per cent of the freight traffic of the C. & O. is bituminous coal—the weekly car loadings in normal times quite often exceeding 24,000 cars. Russell yard is the concentration point for the coal traffic and a great volume of it moves west over the line from Russell to Toledo.

The necessity for longer locomotive runs, increased train speeds and lower operating costs placed before the C. & O. officers an operating problem, the consideration of which and the solution to which forms the subject of this article.

Between Russell and Columbus, at which latter point most of the coal trains were broken up prior to the introduction of the new 2-10-4 type locomotives, is a distance of 110 miles with a ruling grade of 0.7 per cent, 1.25 miles long. Over the rest of this territory the profile ranges from level country to 0.2 per cent grades—the latter being from 5 to 12 miles long with the maximum level section 9 miles long. The maximum curvature is a 7-degree curve on a 0.17 per cent grade. From Columbus, Ohio to Toledo is a distance of 126 miles, with three grades of 0.2 per cent each, approximately four miles long and one broken grade averaging 0.4 per cent approximately 15 miles long on which pusher service is required. This trackage is practically tangent.

Prior to the introduction of the 2-10-4 type locomotive between Russell and Columbus, single-expansion articulated locomotives of the 2-8-8-2 type handled these trains in units averaging approximately 140 cars and 10,500 actual tons. When the trains reached Columbus they were broken up and handled from Columbus to Toledo by 2-10-2 and Mallet compound locomotives. It was thought that this operating condition could be improved providing suitable power were available to handle the entire train in a continuous movement from Russell

* A complete description of these locomotives appeared in *Railway Age* November 15, 1930, page 1025.

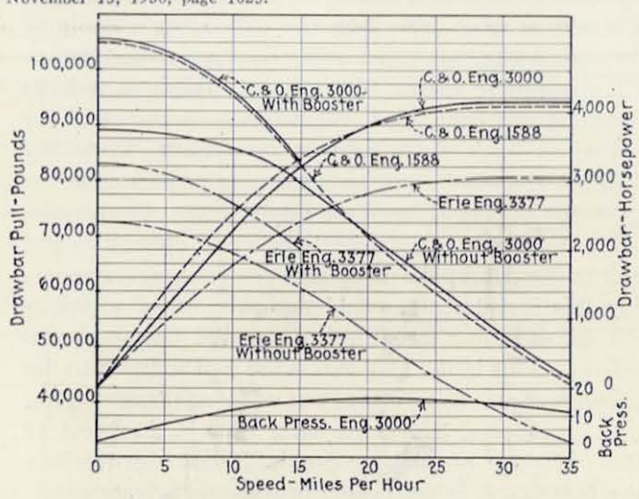
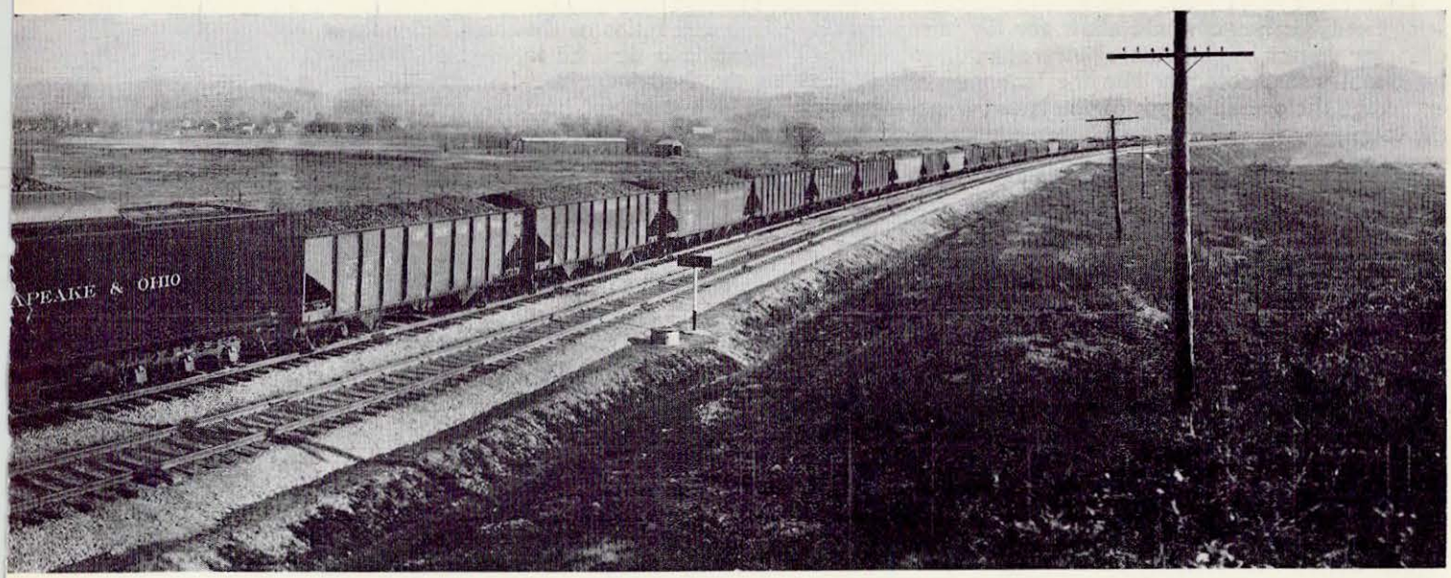


Fig. 1—Drawbar Pull and Horsepower Characteristics of the Three Locomotives Tested



through Columbus to Toledo, eliminating the rehandling of the train and a locomotive change at Columbus. With the idea of determining the possibility of developing a type of power suitable to meet these particular conditions, an investigation was begun in August, 1929.

Road tests were made with the C. & O. single-expansion articulated locomotives, class H-7-a, and these tests disclosed the fact that it was a feasible operating possibility to run trains through but it was found that a locomotive would have to be developed with a driving-wheel diameter substantially larger than the 57-in. drivers on the articulated locomotives.

One of the newer types of locomotives which had been attracting considerable attention at that particular time was the Erie class S-3, 2-8-4 type with 70-inch driving wheels. Road tests on these locomotives had proved them an economical type and with the idea of determining whether or not the particular design was adapted to its operating conditions, the C. & O. borrowed one of these locomotives, No. 3377 and made certain changes to adapt it to the service in the territory mentioned. The changes consisted of increasing the boiler pressure to 240 lb. per sq. in. and a slight increase was made in the weight on driving wheels by making certain alterations in the equalization. After this locomotive was placed in service a number of tests were conducted between Russell and Toledo with trains of the tonnage which it was desired to handle. These tests definitely confirmed the necessity for a locomotive with a larger driving-wheel diameter than the C. & O. articulated type and with greater power than the Erie class S-3 in order to provide a safe margin to protect operation under other than test conditions.

Three Outstanding Facts

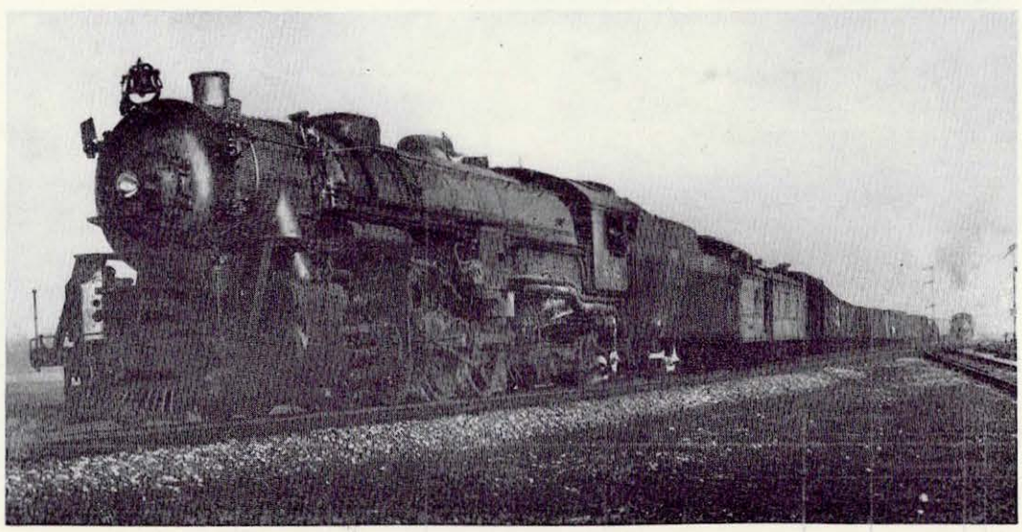
Before making a further study of the two locomotives tested, three outstanding facts presented themselves, namely:

1—That a locomotive of greater power but with approximately the same diameter driving wheels as the Erie Class S-3 would be required.

2—That a locomotive of approximately equivalent power to the C. & O. Class H-7-a (2-8-8-2 type) but with larger diameter driving wheels would be required.

3—That a tender tank would be required of sufficient capacity to allow for continuous operation between Russell and Columbus, (110 miles) with only one stop for water.

A study of the design of the two locomotives tested, therefore, left the Class H-7-a locomotive as the only candidate, but it was developed that it would be impossible to provide sufficient boiler capacity with driving wheels of increased diameter on an articulated locomotive. For this reason the 2-10-4 type of locomotive was considered and finally adopted as best suited for the particular oper-



The Erie 2-8-4 Locomotive Which Was Used During the Road Tests

ating need because it would allow for the incorporation of larger drivers, slightly more power than the articulated type, and would accommodate the large tender without exceeding the overall length of the latter, measured over the couplers.

Road Tests of the New Power

As a result of these investigations, an order was placed with the Lima Locomotive Works in January, 1930, for forty 2-10-4 type locomotives which have been designated as C. & O. Class T-1 locomotives. The first of these locomotives, No. 3000, was placed in service early in September, 1930, and during the past 90 days a number of comparative tests have been made which seem to confirm the judgment of the C. & O. mechanical officers in building them.

Table I—Locomotive Ratios

Type	2-8-8-2	2-8-4	2-10-4
Road	C. & O.	Erie	C. & O.
Fuel	Soft coal	Soft coal	Soft coal
Cylinders	4—23 in. by 32 in.	2—28½ in by 32 in	2—29 in. by 34 in.
Weights in working order:			
On drivers	491,840 lb.	296,800 lb.	373,000 lb.
On truck	35,350 lb.	40,500 lb.	61,000 lb.
On trailer, front wheels	42,640 lb.	59,880 lb.	66,000 lb.
On trailer, back wheels	.....	64,290 lb.	66,000 lb.
Total engine	569,830 lb.	461,470 lb.	566,000 lb.
Driving wheel diameter	57 in.	70 in.	69 in.
Boiler:			
Diameter	Front 93⅞ in.	92 in.	99¾ in.
	Back 99⅞ in.	100 in.	108 in.
Pressure	205 lb.	240 lb.	260 lb.
Tubes, number and diameter	276—2¼ in.	50—2¼ in.	59—2¼ in.
Flues, number and diameter	60—5½ in.	242—3½ in.	275—3½ in.
Tubes, length	24 ft.	21 ft.	21 ft.
Grate area, actual	112.9 sq. ft.	100 sq. ft.	121.7 sq. ft.
Grate, length and width	169 in. by 96¾ in.	150 in. by 96¾ in.	162 in. by 108¾ in.
Heating surfaces:			
Firebox and comb. chamber	467 sq. ft.	308 sq. ft.	477 sq. ft.
Syphons	42 sq. ft.	129 sq. ft.	168 sq. ft.
Tubes	3,903 sq. ft.	616 sq. ft.	726 sq. ft.
Flues	2,073 sq. ft.	4,635 sq. ft.	5,264 sq. ft.
Total evaporating	6,485 sq. ft.	5,688 sq. ft.	6,635 sq. ft.
Superheater	1,885 sq. ft.	2,480 sq. ft.	3,030 sq. ft.
Comb. evap. and superheat	8,370 sq. ft.	8,168 sq.ft.	9,665 sq. ft.
General data estimated:			
Tractive force, main cylinders	103,500 lb.	75,600 lb.	91,584 lb.
Tractive force, with booster	.....	88,100 lb.	106,584 lb.
Cylinder hp. (Cole)	3,904	3,508	3,936
Factor of adhesion	4.75	3.92	4.07
Steam, total per hr. maximum hp.	81,200 lb.	72,970 lb.	81,870 lb.
Boiler hp.	3,697	3,563	4,451
Boiler hp., per cent of cylinder hp.	94.70	101.5	113.1

Table I shows a comparison of the physical characteristics and ratios of the three locomotives, and particular attention is directed to the high boiler ratio in the case of the 2-10-4 Class T-1 locomotive which accounts for the high sustained horsepower output of the cylinders as may be observed from the indicator cards which are shown in Fig. 7.

In Table II will be found a tabulation of comparative average results which have been obtained during road performance tests with the C. & O. dynamometer car between Russell and Toledo. During these tests the locomotive was operated at full throttle and a constant predetermined back pressure was maintained as nearly as possible at all times.

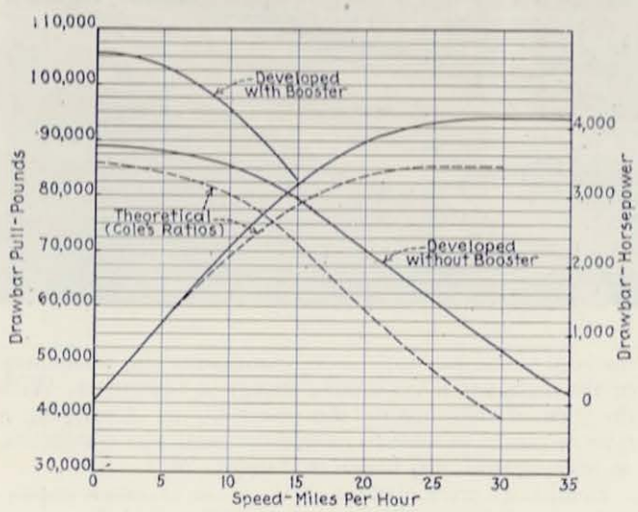
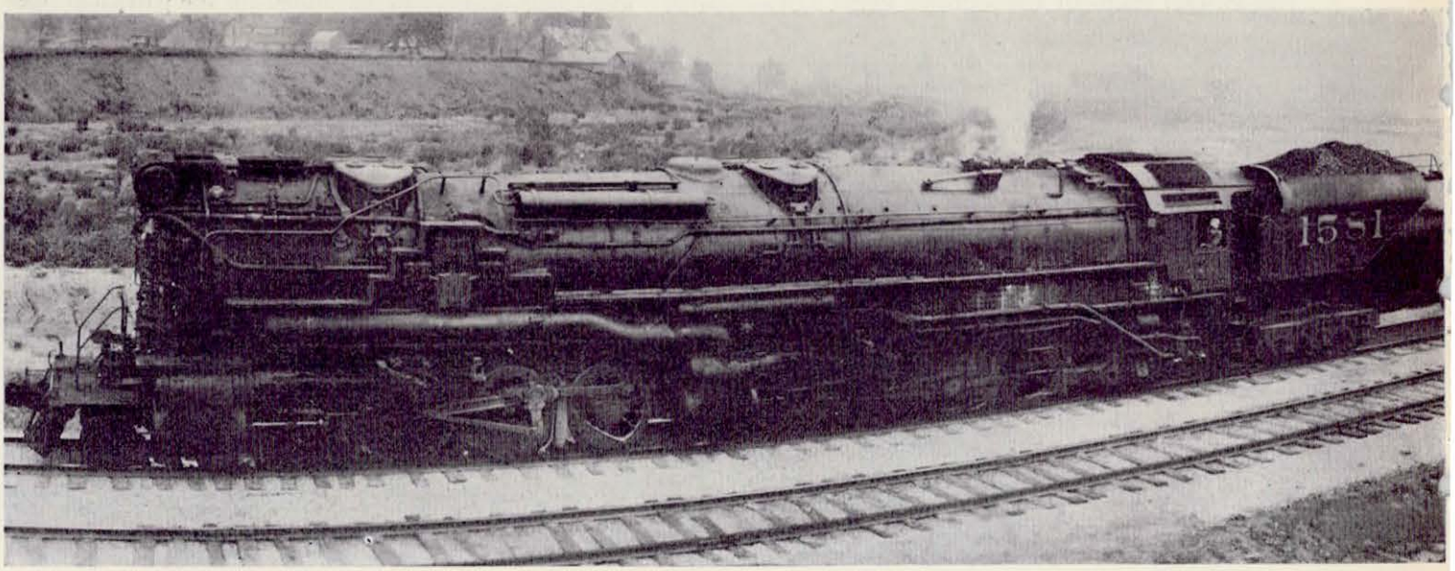


Fig. 2—Drawbar Pull and Horsepower Characteristics of C. & O. Locomotive No. 3000

A number of interesting comparisons and facts may be drawn from Table II. Attention is directed to the maximum firebox temperatures shown. In the case of locomotives No. 1588 and No. 3377 the pyrometer thermocouple was located in the sidesheet of the firebox while in the case of locomotive No. 3000 the temperatures were taken through the fire door with a radiation pyrometer. Attention is also directed to the low average B.t.u. content of the coal used during the tests with locomotive No. 3000. This is due to a difference of approximately 1,500 B.t.u. per lb. between the coal used



One of the C. & O. Class H-7-A Mallet Locomotives

south of Columbus and that used between Columbus and Toledo whereas in the case of the tests with C. & O. locomotives No. 1588 and Erie No. 3377 practically uniform coal was used on the entire run from Russell to Toledo.

Description of Charts

Fig. 1 shows the average drawbar pull and drawbar horsepower versus speed as actually developed during the dynamometer-car road tests with constant predetermined back pressure and full throttle throughout the run. These curves do not show the maximum drawbar pull or horsepower possible. The predetermined back pressure used was governed by the speed restrictions and topographical characteristics of the railroad line over which the tests were conducted. It will be noted that the operating back pressure appears to be somewhat higher than is usually considered good practice. Owing to the primary desire to operate these locomotives over two divisions, and the necessity of using a lower grade of coal between Columbus and Toledo, it was necessary to draft the locomotive in such a manner as to burn the lower grade of coal properly. The tests, having been conducted on the first engine of the order, are of a preliminary nature and in due course further tests will be conducted to determine the proper nozzle size to furnish sufficient draft for proper combustion. Sufficient data have already been collected to determine positively that a considerable reduction in back pressure can be made with the consequent increase in efficiency and drawbar pull.

Fig. 2 shows a drawbar pull and horsepower in relation to speed for locomotive No. 3000 as calculated according to Cole's ratios and the actual rated as developed during the tests. Figs 3, 4, 5 and 6 are self-explanatory

Table II—Tabulation of Comparative Average Results of Dynamometer Car Tests on the C. & O. Between Russell, Ky., and Toledo, Ohio (1929 and 1930)

	With pusher on 0.7 per cent grade, 1.25 miles long, C. & O. engine No. 1588	With pusher on 0.7 per cent grade, 1.25 miles long, Erie engine No. 3377	Without pusher, C. & O. engine No. 3000	Advantage No. 3000 over No. 1588 Per cent
No. of test runs	4	4	4	.....
Season of year	Summer	Summer	Summer	.....
Train consist:				
No. loads	140	140	139	.....
No. others	4	4	2	.....
Total number cars	144	144	141	.....
Actual tonnage	10,724	10,857	10,939	+ 2.00
Total time en route	13 hr. 59 min.	13 hr. 9 min.	13 hr. 17 min.	.....
Road delays	2 hr. 40 min.	1 hr. 56 min.	2 hr. 35 min.	.....
Net running time	11 hr. 19 min.	11 hr. 13 min.	10 hr. 42 min.	— 5.45
Average speed, m.p.h.	20.51	20.65	21.69	+ 5.75
No. stops	13	10	11	.....
Total coal as fired	87,550 lb.	82,150 lb.	75,900 lb.	—13.31
Total water	69,410 gal.	64,606 gal.	62,219 gal.	—10.36
Coal as fired per 1,000 gross ton-miles	35.41 lb.	32.96 lb.	30.22 lb.	—14.66
Coal as fired per sq. ft. grate area per hr.	81.30 lb.	84.65 lb.	71.37 lb.	—12.21
Evaporation, water per lb. coal as fired	6.64 lb.	6.54 lb.	6.76 lb.	+ 1.81
Coal per drawbar hp.-hr. as fired	3.521 lb.	3.35 lb.	3.37 lb.	— 4.29
Water per drawbar hp.-hr. actual	23.32 lb.	21.81 lb.	22.64 lb.	— 2.92
Average drawbar hp.	2,632	2,531	2,625	.....
Average drawbar pull	46,882 lb.	45,499 lb.	43,921 lb.	.....
Maximum drawbar pull, starting, with booster	.....	85,000 lb.	105,500 lb.	.....
Maximum drawbar pull, starting, without booster	105,000 lb.	.....	.....	.....
Maximum drawbar pull at 30 m.p.h. without booster	53,000 lb.	45,000 lb.	57,000 lb.	.....
Maximum i.hp. at 30 m.p.h.	.....	.....	4,775	.....
Average boiler pressure, lb. per sq. in.	204	239	258	.....
Average steam chest pressure, lb. per sq. in.	173	221	244	.....
Average back pressure, lb. per sq. in.	8.2	10.2	11.4	.....
Average cut-off, per cent	42.7	55.4	52.6	.....
Maximum steam temperature, deg. F.	.....	.....	765	.....
Maximum firebox temperature, deg. F.	.....	.....	2,600	.....
Average B.t.u. per lb. coal as fired	13,834	13,493	13,026	.....
Per cent moisture in coal as fired	2.44	3.34	1.91	.....
Overall thermal efficiency at drawbar	5.22	5.63	5.80	+11.1

and are plotted from log sheets of the readings obtained during the road tests with engine No. 3000. In this connection, it was felt that the steam temperatures

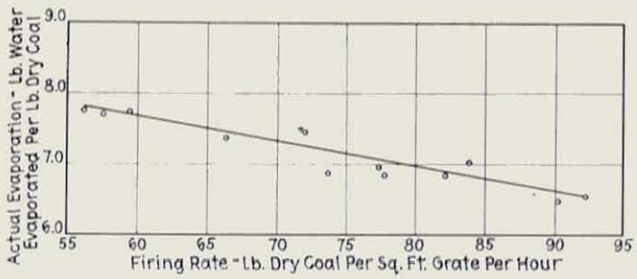


Fig. 3—Evaporation Per Pound of Dry Coal in Relation to the Firing Rate—Locomotive No. 3000

would have been appreciably higher were it not for unsatisfactory local water conditions due to the drought in the territory in which the tests were run. From Fig. 5 it will be noted that the smokebox temperature is low as compared with the high temperature of superheated

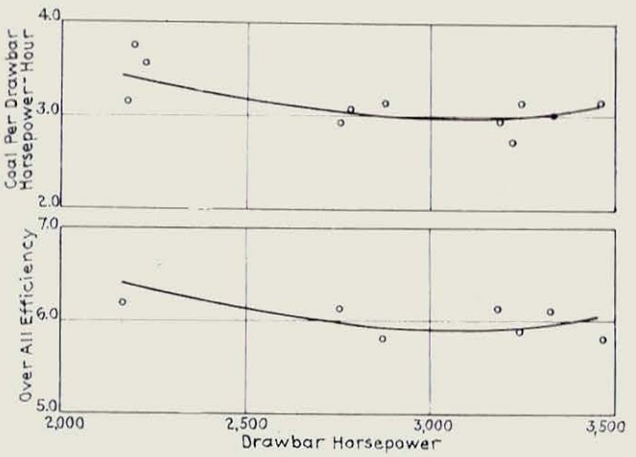


Fig. 4—Relation of Drawbar Horsepower to Overall Efficiency and Dry Coal Per Drawbar Horsepower-Hour—Locomotive No. 3000

steam in the steam pipe, indicating satisfactory gas passage and heat absorption.

Fig. 7 shows actual indicator cards obtained during the test with locomotive No. 3000 showing the maximum horsepower developed. It will be noted that this is appreciably higher than the average drawbar horsepower during the tests.

It was also found that, considering the average drawbar horsepower developed over the entire division for the four test runs with each locomotive, engine No. 1588 worked 68 per cent of its rated output; engine No. 3377, 89 per cent and engine No. 3000, 65 per cent for each of their respective average running speeds between Russell and Toledo.

Auxiliary Equipment Used

All three of these locomotives were equipped with mechanical stokers and feedwater heaters, and, in the

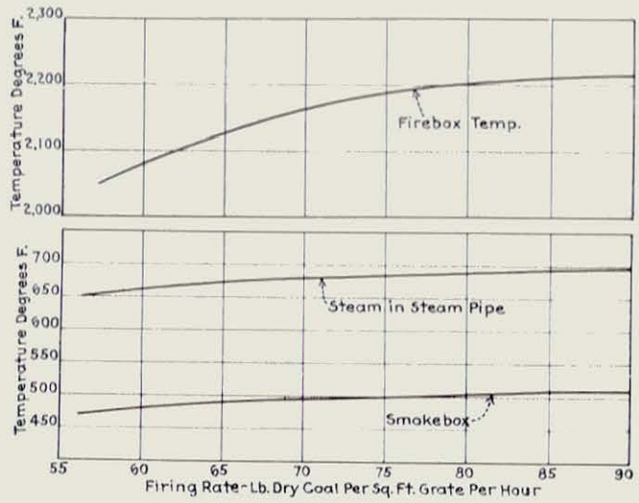


Fig. 5—Relation of Firebox, Steam and Smokebox Temperatures to the Firing Rate—Locomotive No. 3000

cases of Erie locomotive No. 3377 and C. & O. locomotive No. 3000, with trailer boosters.

In the development of the design of the Chesapeake & Ohio 2-10-4 type locomotives three locomotive builders and certain manufacturers of specialties co-operated

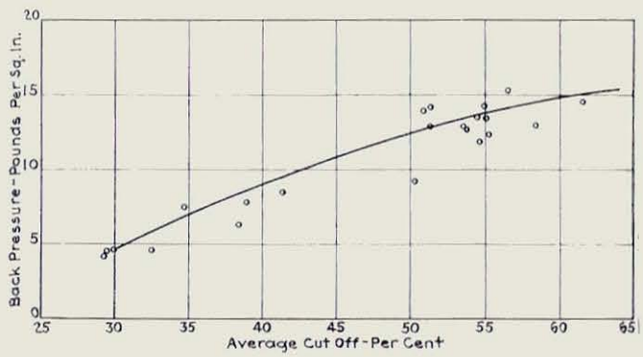
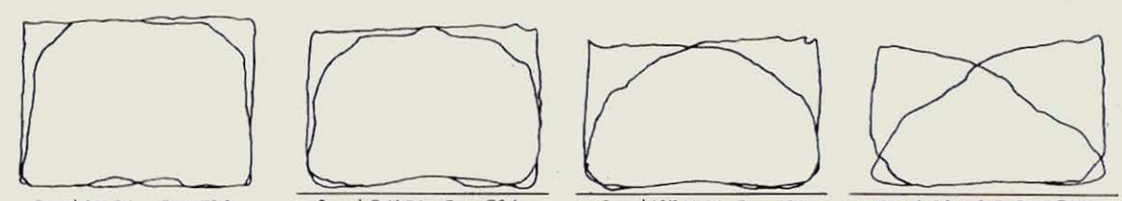


Fig. 6—Back Pressure in Relation to Cut-Off—Locomotive No. 3000

with the railroad company's mechanical engineering department.



Card J M.P.2 Run 724
Speed 5 M.P.H. Total I.Hp. 909
Int. Press. 247 Lb.
Cut Off 80 Per Cent
R.S.

Card D M.P.1. Run 724
Speed 10 M.P.H. Total I.Hp. 2042
Int. Press. 247 Lb.
Cut Off 78 Per Cent
R.S.

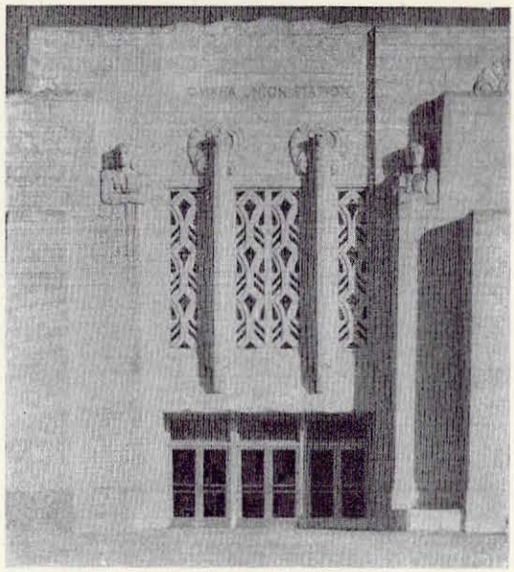
Card 103 M.P.6 Run 720
Speed 20 M.P.H. Total I.Hp. 3890
Int. Press. 225 Lb.
Cut Off 63 Per Cent
R.S.

Card 124 M.P.33 Run 720
Speed 30 M.P.H. Total I.Hp. 4810
Int. Press. 220 Lb.
Cut Off 50 Per Cent
R.S.

Fig. 7—Indicator Cards Taken During the Road Tests of Locomotive No. 3000

Open New Union Station at Omaha

Facilities provide marked increase in track capacity and include a headhouse of striking design



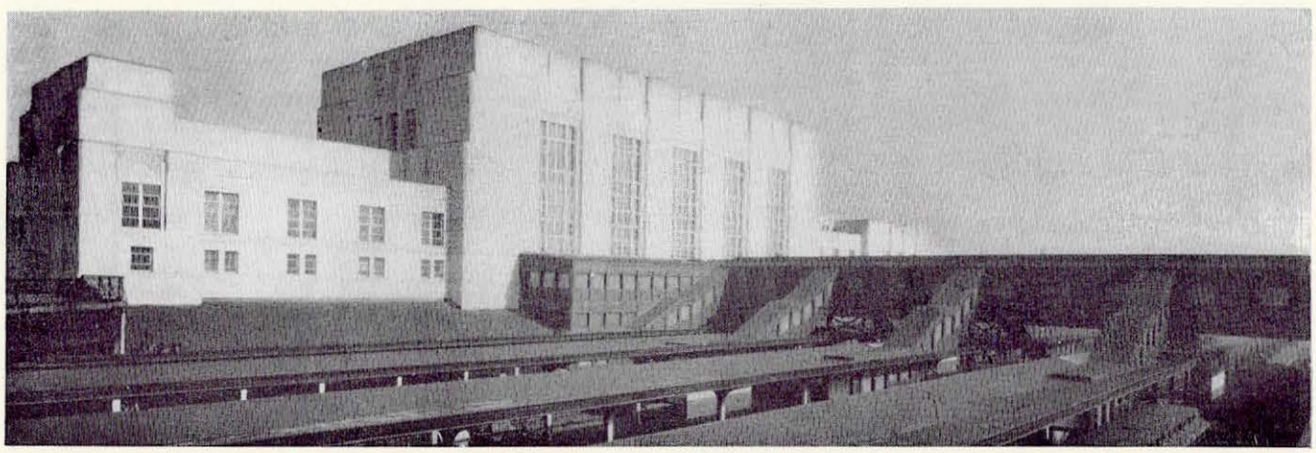
The Tenth Street Entrance—a Striking Architectural Composition

AT 6 a. m. on January 6, a new union station was placed in service at Omaha, Neb., thereby marking the completion of a $3,400,000 project that had been in progress for 17 months. The station occupies the site of the old Union Pacific station, erected in the late nineties, and was built for the accommodation of the same railways (except the Chicago Great Western) that used the old terminal, namely, the Chicago & North Western, the Chicago, Milwaukee, St. Paul & Pacific, the Chicago, Rock Island & Pacific, the Illinois Central, the Missouri Pacific, the Union Pacific and the Wabash. A total of 82 regular trains start or terminate their runs or pass through this station daily.

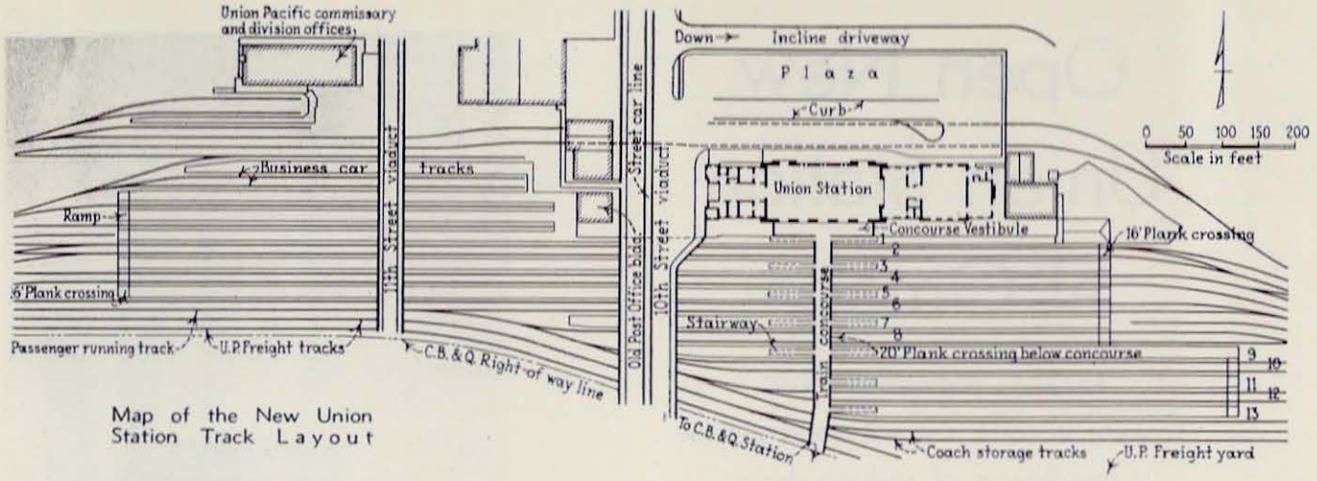
The object of the project was to provide a sorely needed enlargement of track capacity and overcome the inconvenience, delays and hazards of an old station of the single-level through type in which all trains except those occupying the track most remote from the headhouse had to be cut in two for the movement of passengers, baggage, mail and express. Not only have these objectives been realized in a plan which replaces 9 through tracks with 13 through tracks affording more than double the car capacity, and which embodies a separation of the grades of the tracks and the station floor but, in addition, there has been provided a station building which is both larger and more commodious than the one it replaces and which is most unique in its architectural composition as well as in the various appointments that go to make up a complete passenger terminal.

As the project involved replacement on the same site, it was necessary to provide a temporary station structure but continue the use of the station tracks during an extensive remodeling of the track layout, the reconstruction of platforms and sheds, the building of new and the rebuilding of old overcrossings and undercrossings for adjacent streets, and the conduct of other construction operations. Yet this was done without delays to trains or a reportable injury to any railway employee, although all work within the track area was performed by railway forces.

Like its predecessor, the Union Station is located on the through tracks of the Union Pacific which extend to the east across the Missouri river to the terminus at Council Bluffs, Iowa, and to the west through Ogden, Utah, to Los Angeles and Southern California, and to Portland, Ore., and the Pacific Northwest. Trains of the various roads using the station enter it from both the east and the west. The station site fronts on the east side of Tenth street which is carried over the tracks on a viaduct, so the situation was one naturally favoring a two-level station with the main floor at the street viaduct level and a concourse extending out over the tracks from which stairways communicate with each platform.



The New Station as Seen From the South—Showing the Concourse, Concourse Lobby, Stairways and Platform Sheds



Map of the New Union Station Track Layout

An entrance from the Tenth Street front sufficed for the arrival and departure of passengers using street cars, but would not meet the problem of taxicab users or those passengers arriving or departing in private automobiles. Accordingly, the project included an elevated plaza north of the station, 410 ft. long and averaging 155 ft. in width, which provides adequately for the maneuvering and parking of street vehicles. This arrangement obviously exerted a pronounced influence on the planning of the station interior to the end that the movement of passengers through the station would be effected with the maximum of convenience. The plan adopted is an exceedingly simple one.

A Large Waiting Room

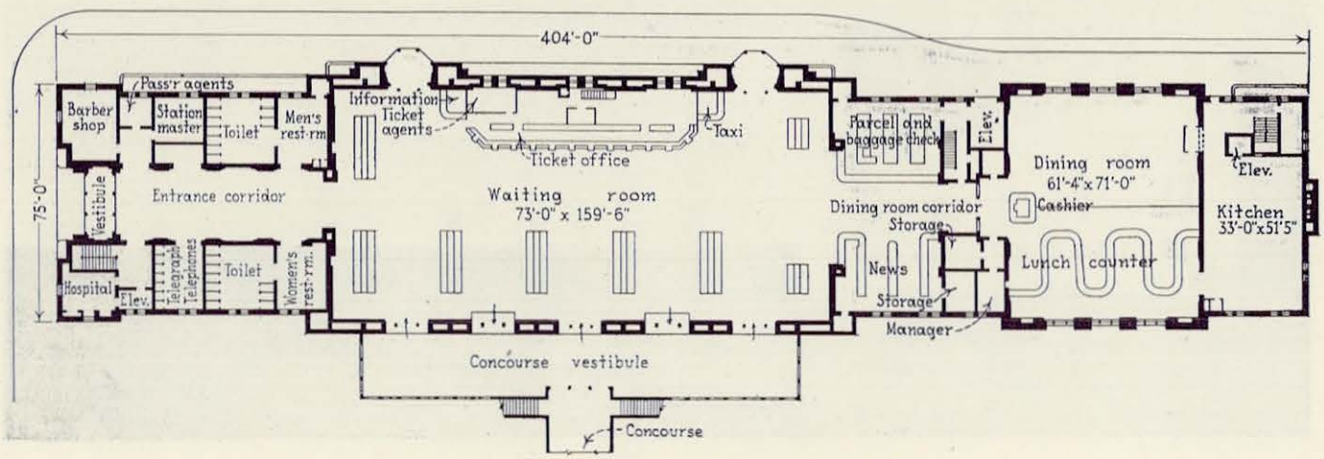
The dominating feature of the station, namely the waiting room, is a great hall 159½ ft. long, 73 ft. wide and 60 ft. high, that occupies the full width of the building, approximately midway of its length. On the north side, vestibuled doorways open out on the sidewalk flanking the plaza, while on the south side a battery of five quadruple doorways communicate with the concourse. To the west, a central corridor 22 ft. wide and 64 ft. high extends for a distance of 69 ft. 4 in. to a vestibuled entrance from Tenth street, while at the opposite or east end of the waiting room is a corridor or passageway leading to the restaurant which occupies the full width of the east end of the building.

Three utilities of primary importance to the traveler, namely, the ticket office, the information counter and the taxicab counter, are located within the waiting room. The ticket office occupies a space 73 ft. long by 18 ft. wide located symmetrically against the north wall, while the taxicab and information counters flank it on the east and west respectively. On the north side of the dining-room corridor, and so placed as to be readily seen from any point within the waiting room, is a composite parcel-check and baggage-check counter, while equally conspicuous on the opposite side of this corridor is a news stand and general concession space.

The combined parcel and baggage checking room is an innovation in that one group of employees serves passengers in checking parcels or bags for storage in steel racks, in checking hand baggage, and in the exchange of transfer checks and baggage checks for trunks received in the main baggage room on the floor below. Outgoing hand baggage is delivered to the lower floor by a spiral chute while incoming hand baggage is brought up on an elevator which is used also by red caps in handling passenger luggage and invalid wheel chairs. Pneumatic tubes are used for the handling of checks between baggage rooms.

Other Facilities in the West Wing

In the west or entrance corridor, just outside the waiting room, doors on the north and south lead to rest and toilet rooms for men and women, respectively, while to the west of them on the two sides of the corridor, space has been provided for a telegraph and telephone room, a hospital, a barber shop, a travelers' aid counter, a station master's office and an office for the depot passenger agents. The hospital is a room 12 ft. by 18 ft. at the southwest corner of the building, and is fully equipped to handle both minor indispositions and emergency cases. Opening out of both the hospital and the entrance hall is an invalid lift which rises from the track level to the main floor. It will take both stretchers and invalid chairs.



Plan of the Main or Street Level Floor of the Station

One of the distinctive features of the station is the manner of handling passengers to and from the track platforms. The train concourse has a width of only 20 ft. and is not heated, being designed to function purely as a passageway between the station proper and the platform stairways. To carry out this idea, an enclosure 140 ft. long by 20 ft. wide has been provided outside the south wall of the waiting room which has been designated as the concourse vestibule. This serves the dual function of a weather vestibule in winter and as a distributing space between the doors at the north end of the concourse and the five quadruple doorways that connect the waiting room with this vestibule. Another essential feature of this arrangement is provision for the control of entrance to the concourse vestibule from the waiting room, two of the quadruple doorways being provided with gates for the examination of tickets of outgoing passengers, while the other doors are assigned exclusively for the use of passengers entering the waiting room from the concourse.

The Track Level Floor

Flanking the plaza on the north is an inclined driveway 30 ft. wide which affords a connection between the Tenth Street viaduct and the track level for the use of street trucks handling baggage, express and mail. The plaza serves as the roof over a large area tributary to a long concrete platform that flanks the entire north side of the station at the lower level and serves the various utilities occupying the lower story of the station. These embrace, from east to west, the heating plant, the bakery and food and equipment storage for the restaurant, a refrigeration plant, the baggage room, express facilities, and an office and lockers and toilet rooms for the mail handlers. Mail handling at the station is confined to a mail-car to mail-truck movement and vice versa. The express department includes a locker room, a lunch room, a supply room, storage space and record room. In the area allotted to the baggage department and storage is the electric storage room, the battery room, the electric shop, the switchboard and transformer room, baggage record room, unclaimed baggage room and locker rooms, lunch rooms and toilet rooms for trainmen, red caps and other employees.

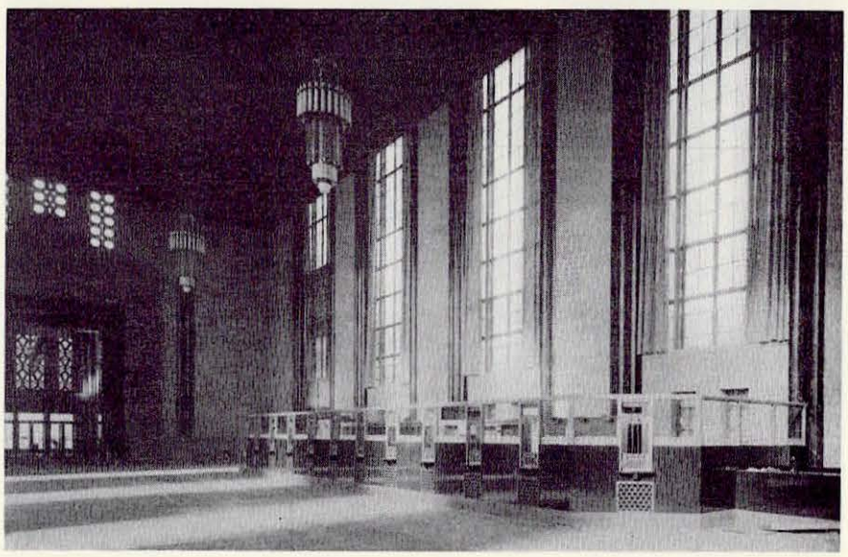
Along the south side of the building at the lower level, and separated from the platform serving Track 1 by an iron fence, is a covered trucking platform that provides the means of communication between any space on the lower floor and the three planked crossings that have been provided for trucking across the tracks to the various platforms. One of these crossings is directly under the concourse and the other two are located at or near the ends of the platforms.

An Architectural Innovation

The architectural treatment of the station, both exterior and interior, is of a character which, for want of a better name, must be designated as "modern." As indicated by the illustrations, the exterior, done in a cream colored terra cotta of a soft texture, has lines that faintly suggest the Egyptian, but is almost Greek in its simplicity of detail. The composition is a symmetrical one that emphasizes the central mass occupied by the waiting room and creates a general impression of solidity and strength.

The use of ornamentation is limited, embellishments being confined to the spandrels over the windows, the clerestory over the Tenth Street entrance—and one particularly distinctive feature—four bust figures gracing the pilasters flanking the two main entrances which represent in highly conventionalized form, the engineer, the mechanic, the engineman and the trainman.

Turning to the interior, one finds that color and texture rather than form or outline are the prime elements of the treatment. The waiting room, for example, is a rectangular room of simple outline. Its flat ceiling is devoid of heavy coffers or beams and its walls of Caen stone are set off solely by pilasters of moderate projection between large rectangular windows in the north and south sides. Head high around the room is a wainscoting of polished black Belgian marble, while above this flanking each of the windows are columnettes of Blue Belge marble with a fine grain of white running through it.



West and North Walls of the Waiting Room Showing the Ticket Counter

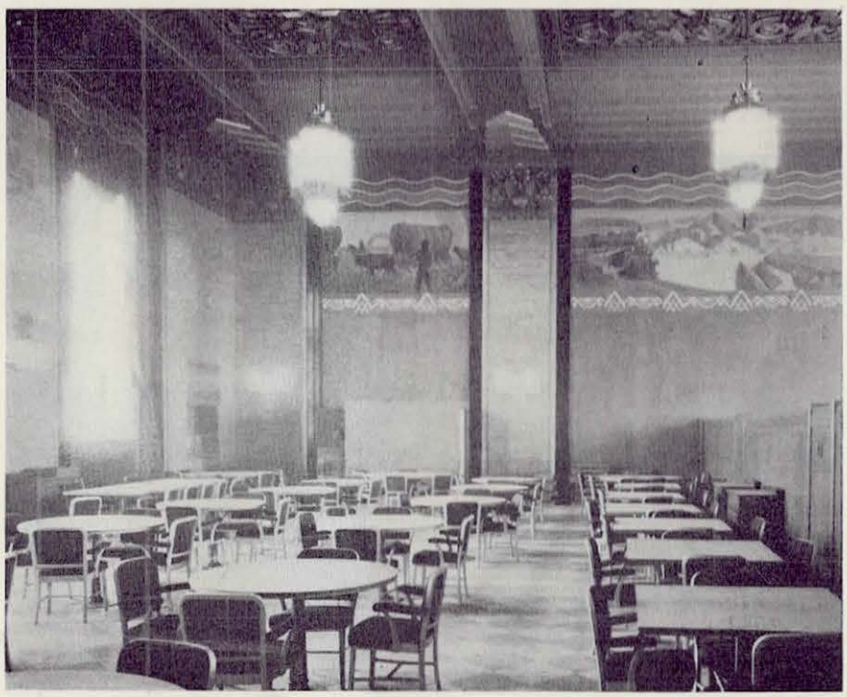
Rose Tinted Glass

A more elaborate treatment in Blue Belge marble and St. Genevieve is used to set off the large openings into the corridors at the two ends of the room. Antiqued bronze provides the ornamentation of the shallow spandrels over the windows, and this is carried out also in the mullions of the windows themselves, while the glass is of a rose tint. The floor, as in all other rooms, is terrazo laid out in colored patterns with brass-strip joints. The ceiling is done in graded tones of blue,

gray and green with silver, gold and aluminum leaf emphasizing the ornamentation.

An harmonious treatment is carried out in the service facilities within or adjacent to the waiting room. Thus, the counter of the ticket office, and the information, taxi and baggage counters are black Belgian marble like that of the wainscot. The framing of the glass screen over the ticket counter is of bronze, which is employed also in the train gates.

Among the most impressive features of the room are the six great lighting fixtures suspended from the ceiling by groups of parallel bronze rods, and consisting of crystal cylinders made up of heavy fluted glass supported by a bronze frame. Each of the chandeliers contains 104 lamps of a total 5320 watts. Supplementing this general illumination, is a unique form of reading light provided in the construction of the waiting room seats. These seats, which are of a plain design in oak finished in a weathered gray acid stain, are equipped with a hood at the top of the back rest in which concealed lamps provide light at the correct angle for reading but cannot be seen from a standing position.



The Dining Room

The Restaurant

The restaurant, which is 71 ft. by 64 ft. 4 in., also carries out the modern idea in harmony with the waiting room. The general color scheme is the same, but the walls are of Italian Travertine with silver and patent-leather architraves bounding the windows. However, the dominating feature of this room is a series of mural paintings of the modernistic or primitive order depicting various railway and pioneer subjects.

The room is divided in the center by a rail partition 6 ft. high into a dining room and a lunch room, the former seating 108 people at round and square tables and the latter 63 persons at a counter arranged in a succession of connected horseshoes. The kitchen to the rear of the restaurant is 51 ft. 5 in. by 33 feet and an elevator and a stairway connect with auxiliary restaurant facilities on the track level, while the stairway also connects with a mezzanine floor where lockers, toilets and wash and rest rooms have been provided for the women employees.

The Concourse

The concourse is a corridor 20 ft. wide extending south from the concourse vestibule for a distance of 282 ft. to a connection with a similar concourse serving the recently reconstructed passenger station of the Chicago, Burlington & Quincy, thereby affording a convenient means for the interchange of passengers between the two stations. However, the primary function of the concourse is to afford access to the stairways leading to the various platforms, duplicate flights to the east and west being provided for the five platforms nearest the station and one stairway on the east side, only, for each of the two most southerly platforms.

The concourse is a steel frame structure, with walls and ceiling sheathed on the inside with Transite asbestos board, while the roof and walls are covered on the outside with sheet copper which is used also to form the enclosure for the stairways down to a level about seven feet above the platforms. Below this level the stairs are enclosed in and supported on concrete walls. This form of construction produces dead spaces under the stairs, which are provided with doors at the rear so that they may be used as closets for the storage of Pullman and dining car supplies, carmen's equipment, etc. As the concourse is not heated, there was no occasion to provide doors at either the foot or head of the stairs and their omission is of definite convenience to passengers carrying their own luggage.

How the Track Layout Was Expanded

The platform sheds are of the butterfly type with steel frames and wood plank roofs covered with Johns-Manville built-up roofing. The platforms themselves except for the trucking platform along the south side of the building, which is paved with concrete, are paved with brick on sand fill retained by concrete curbs. But an exception to usual construction is to be found in the fact that the brick is carried out to the edge over the curb in the form of a row of headers. The platforms

have a height of eight inches above the top of the rail except at the trucking crossings where they are ramped down to top-of-rail level.

The layout of tracks and platforms was influenced largely by the conditions under which the enlargement of the old layout had to be carried out. Because the property line between the Union Pacific and the Burlington rights-of-way does not run east and west, but bears to the northwest at an angle of about 17 deg., the Union station tracks occupy a somewhat wedge-shaped area, narrower at the west end than at the east. The situation was further aggravated in the old layout by a pronounced "bulge" to the north in the right-of-way line in the vicinity of Eleventh street which served to neck down the Union Pacific layout at that point, while to the east, from a point opposite the center of the station, the property south of the station was largely occupied by a freight yard which cut off extension of the station layout to the south.

The first of these obstructions was removed by an agreement whereby a shift in the westerly end of the Burlington station layout made it possible to widen the area for the Union station development at the west end sufficient to extend five of the old station tracks to the west for an average distance of about 400 ft. and also provide room for two Union Pacific freight running tracks and a lead track from the west to the station tracks that could not be extended to the west. In addition, by moving to the east the ladder track at the west end of the Union Pacific freight yard, it was possible to increase the length of old Track 9 and provide space for four new station tracks (Tracks 10 to 13 inclusive) and two coach storage tracks. However, as will be observed on the map, Tracks 6 to 13, inclusive, have the larger part of their length east of the axis of the station.

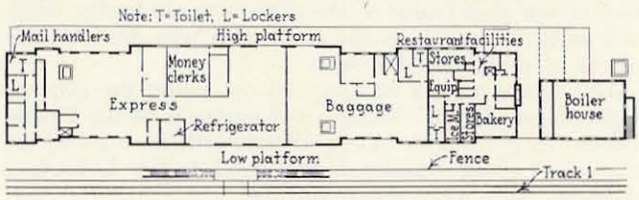
In addition to the 13 through tracks, the station layout includes five stub tracks on the north side west of Tenth street, which are normally used for the parking of business, sleeping and dining cars, although two of them are of a length such that they can readily accommodate short trains. The track spacing of the through tracks conforms to the original layout, 27.3 ft. across platforms and 12 ft. between platforms, except that all new tracks are spaced 13 ft. center to center between platforms.

Track Standards and Utilities

The tracks are laid with 100-lb. Union Pacific section rail. Turnouts have No. 9 or No. 10 frogs, and slip switches are equipped with movable center points. The ballast is Sherman Hill disintegrated granite. Drainage for both tracks and platforms embraces cross drains of 6-in. and 8-in. vitrified pipe that intercept downspouts at alternate shed columns and catch basins in the intertrack spaces. Water-supply lines cross the track layout at intervals of about 100 ft. with standard hose connections in manholes in the center of each platform. Steam lines for the preheating of coaches are laid in Wycoff logging into which scrap superheater tubes were inserted to serve as a lining to facilitate the pulling of the steam pipes when necessary for repairs.

Train and engine movements in the old station were under interlocking control, but the great increase in the number of tracks and switches made it necessary to increase the number of levers in each plant with the result that a new tower was built to accommodate each plant, the machine in the east plant was moved to the west plant to increase its capacity, and an entirely new machine was installed in the east plant. The plants are of the G.R.S. all electric type, with 139 working levers in the machine of the west tower and 121 working levers in the machine of the east tower. Each tower is equipped with an illuminated track diagram. Most of the signals are of the Model-ZA dwarf semaphore type with disk blades.

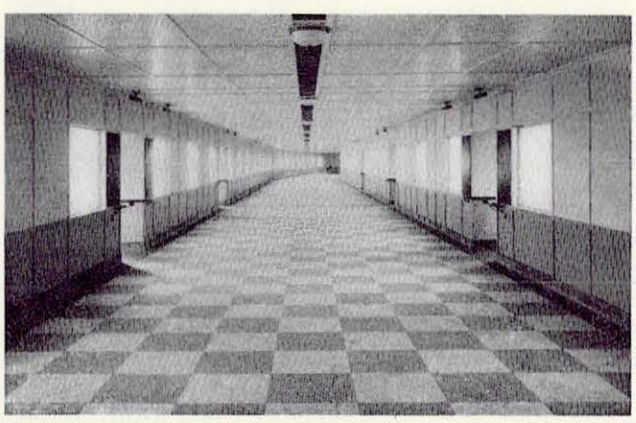
Because of a complete separation of the grades of the tracks and those of the intersecting north and south streets, the track changes entailed extensive construction and reconstruction work on five grade-separation structures. The superstructure of the subway at



Plan of the Station at the Track Level

Seventh street was entirely rebuilt and the structure was extended 176 ft. The viaduct at Tenth street was extensively remodeled, while the 200-ft. truss span over the station tracks in the Eleventh Street viaduct is to be replaced by several shorter spans. The Thirteenth Street subway was extended and the superstructure of the Fourteenth Street subway was strengthened and provided with a 10-in. concrete cover slab. All of these changes had to be carried out without delay to the traffic and a minimum of interruption in the use of any track.

It was in the construction of the station building that the problem of continuity of service was imposed in the most emphatic way, since all of the old structure except the boiler house and the small mail service building at the Tenth Street end of the station had to be removed before work could begin on the new structure. As this precluded use of any portion of the site for station purposes during construction, a temporary frame station building was erected at track level, east of Tenth Street and south of Track 8. An enclosed ramp provided the connection between the station and the Tenth Street viaduct for foot passengers, while a ramp driveway placed in a cut excavated to the level of the Seventh Street subway and carried out through a break cut in the west abutment of that structure provided the means of access for street vehicles. This temporary station will now be removed to permit the completion of the tracks, platforms and train sheds in the area which it occupies.



Looking South Through the Concourse

The razing of the old station was started on July 30, 1929, and was a slow job because the heavy grill-aged foundation upon which it was supported had to be removed to permit the driving of Raymand reinforced concrete piling for the new building. This work was done during the winter, and the footings were ready for the steel frame by March 1, 1930, this being fabricated and erected by the McClintic-Marshall Company, Pittsburgh, Pa. Peter Kiewits Sons Company, Omaha, Neb., had the general contract for the station building, but all track work, the construction of the platforms, the plaza and the inclined drive, the erection of the steel frame of the concourse, all bridge work and all utility work on the track area was done by the forces of the Union Pacific.

The entire project was carried out under the general supervision of H. C. Mann, chief engineer of the Union Pacific System, with W. S. Woodworth as engineer in charge. Gilbert Stanley Underwood & Co. Ltd., Los Angeles, Cal., were the architects.

Railways Largest Scrap Producers

APPROXIMATELY 4,500,000 gross tons of scrap iron and steel were produced by the railroads of the United States last year, according to estimates by the Research bureau of the Institute of Scrap Iron and Steel, on the basis of returns by the railroads to the institute. This made the railroads one of the largest contributors to the iron and steel scrap supply, which totalled 30,000,000 tons for the country.

Of a total of 1,800,915 tons, reported by a large group of railroads which submitted complete reports, 1,030,523 tons were sold to scrap dealers for processing and disposition on the various markets, 411,169 tons were sold direct to mills and other consumers of scrap under various arrangements, and 359,223 tons were sold without any division being reported by the railroads. While many roads sell most of their scrap on monthly bids, a fair proportion of the total consists of car wheels, which are shipped to car wheel manufacturers on an exchange basis. These shipments are included in the total of 411,169 tons sold direct to consumers. Of the 1,800,915 tons analyzed by the institute, 1,306,835 tons were prepared scrap. Detailed reports of 15 of the larger roads were made available for the survey. These reports showed that a total of 1,451,891 tons sold by the roads was graded as follows:

	Gross Tons
Iron arch bars and transoms	17,029
Axles	18,526
Angle and splice bars	23,782
Boilers	19,163
Bolsters and side frames	17,323
No. 1 busheling	4,156
No. 1 cast	28,405
Standard-section T-rails	98,931
Other steel rails scrap	216,540
Sheet scrap	43,007
Tires	11,420
Turnings	5,225
Mixed borings and turnings	25,613
Cast iron car wheels	191,277
Other cast scrap	30,460
Couplers, knuckles, coil and leaf springs, rolled steel wheels	44,117
Frogs and switches	14,531
Flues	16,506
Malleable scrap	28,880
No. 1 heavy melting steel	139,354
No. 2 heavy melting steel	20,766
Old iron rails	389
Miscellaneous grades (not otherwise classified)	436,491
Total	1,451,891

Railway Legislation Slighted by Congress

WASHINGTON, D. C.

ALTHOUGH there are probably more important proposals for railway legislation in the air just now than at any time for some years, and although these proposals have been advanced by powerful organizations particularly interested, there are less indications of activity on the subject in Congress at this session than there have been at any time for several years. Comparatively few railway bills of any importance are pending and very little attention is being given to any of them by the committees to which they were referred, while no dates have been set for hearings on them and the present session expires on March 4.

Proposals for the most vital changes in the provisions of the transportation act are before the Congress in one form or another, but chiefly as recommendations by such bodies as the Interstate Commerce Commission, the National Industrial Traffic League, and the National Association of Railway and Utilities Commissioners. The recommendations of the commission are included in its annual report, while those of the other organizations are in the form of comments submitted to the Senate committee on interstate commerce at its request on the Howell rate-base bill. The railways also have sought a revision of the consolidation provisions of the law.

Before the new session opened in December there had been an expectation that the Senate committee would hold a series of hearings on the Howell bill, which would pave the way for some active efforts toward bringing about a modification of the rate-making rule of the transportation act. The bill is supported to some extent by the Interstate Commerce Commission and Donald R. Richberg, and the National Industrial Traffic League and the state commissioners' association had been planning to take these hearings as an opportunity for their long-planned campaigns for the elimination of the provisions for a percentage return on a valuation basis. The commission also came out in December with its recommendation for a repeal of the recapture clauses, stating at the same time that such a step might easily lead to a revamping of other parts of section 15a. The railways, while also desiring a modification of the recapture rule, seemed about to be forced to a choice between a vigorous defense of the present rate-making rule and a consideration of possible substitutes.

But the Senate committee has done nothing about the Howell bill and is understood to have reached a practical agreement not to take up railway legislation at this session. It has given some desultory attention to the bus bill, which was recommended to it by the Senate, but has given little indication of any intention to press the bill very vigorously and has had some difficulty in getting its members to understand what is in it. The program adopted by the railway executives in November included several important legislative proposals but it is understood there was no intention of pressing them at this session.

The Parker-Fess bills to make more workable the consolidation provisions of the transportation act had been reported out of committee in both the Senate and the House in the Seventieth Congress but they have not been taken up again during the Seventy-First, while the interest of the House and Senate committees in consolidation legislation has been side-tracked into the holding

(Continued on page 202)

Great Western Automatic Train Control

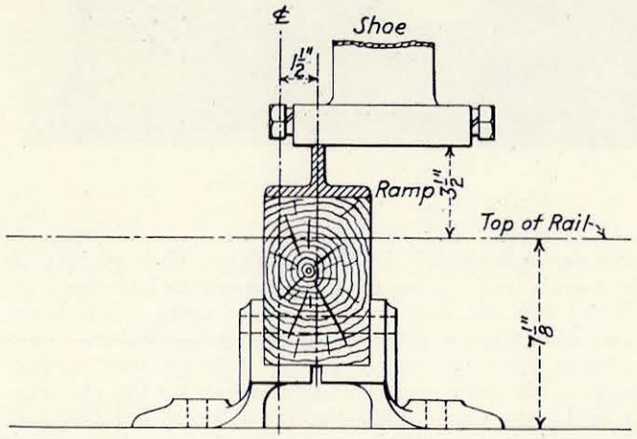
Twenty-four years' experience leads to notable extension of automatic train control in England

AS noted in the *Railway Age* of November 29, page 1201, the Great Western Railway of England has adopted plans for the installation of its automatic train control system throughout hundreds of miles of its lines. The present installation from London to Oxford, High Wycomb and other points, aggregating 372 miles of track, is being expanded to a total of 2,130 miles of track. Locomotives, including both passenger and freight, will be equipped to the number of 2,334. The estimated total cost of this enterprise equals about $1,000,000 and it is expected to complete the work within one year.

Contracts for the equipment on the locomotives have been let to the Westinghouse Brake & Saxby Signal Company, the British Power Railway Signal Company and the General Railway Signal Company. Work of installation will be done by the railway company's forces, including manufacture and installation of ramps.

This is a ramp system, with intermittent mechanical and electrical contact. It was introduced as a cab signal (without brake-setting apparatus) about 24 years ago, on the Fairford branch, and its use has been gradually extended. The mechanical and electrical features of the system, as in use today, are described in the attached drawings.

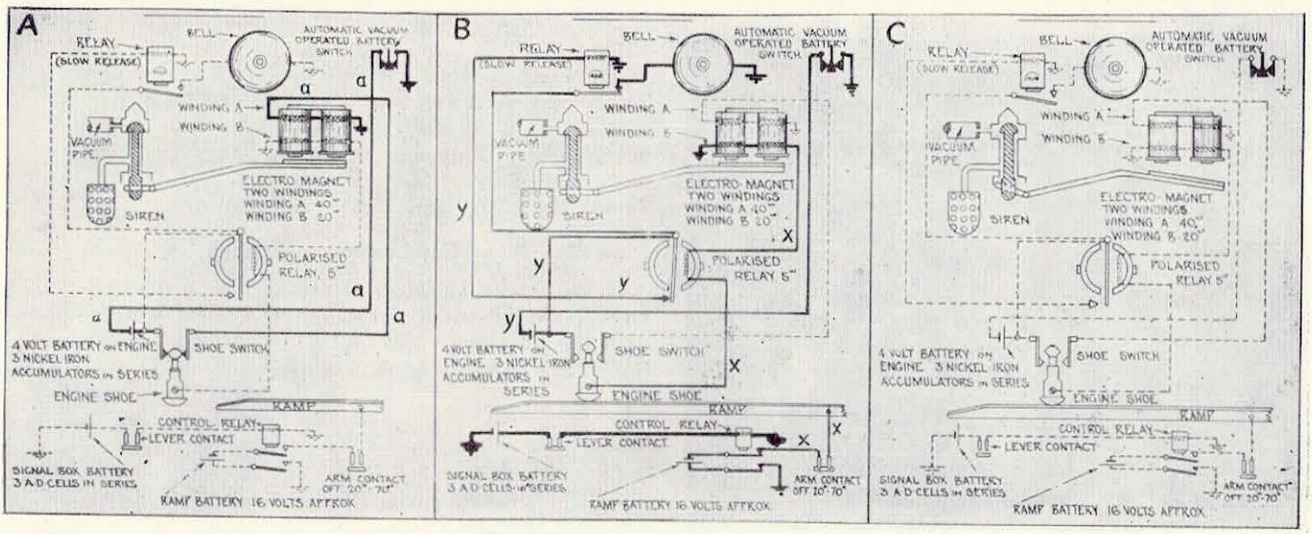
The system, as here described, is operated in connection with manual block signals and the brake is the automatic vacuum system. The control of the ramp to give a proceed or a caution signal is in the hands of the signal man, who opens or closes an electric contact when he moves his distant signal lever; and the application of the brakes on the train is effected by admitting air to the normally exhausted vacuum brake pipe. The caution indication is a siren in the cab, the admission of air to the brake pipe through the siren causing the sound. The proceed indication is a short ring of a bell. The ramp, a steel bar, inverted T-shape, fixed on the roadway, is 44 ft. 3 in. long. It is supported on a timber centrally located between the rails and is staggered 3 in. to the center line; that is to say, the entering end of the ramp is 1½ in. to the right of the center and the leaving end is 1½ in. to the left. The top of the ramp at its highest point is 3½ in. above the level of the top of the rail.



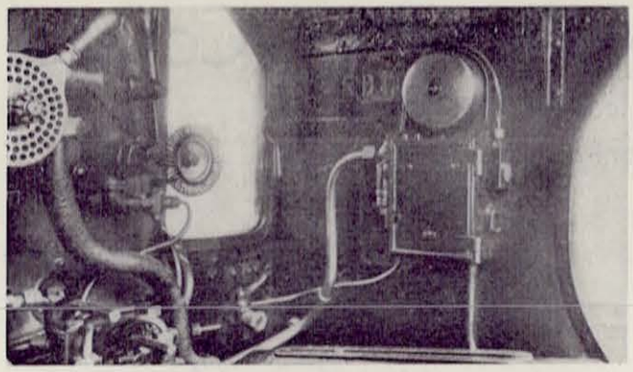
The Ramp on a Curve

The electrical connections will be understood from the diagrams *A*, *B*, and *C*; The first one, *A*, shows the normal condition; *B*, proceed, and *C*, proceed with caution. Normally the electric wire from the signal cabin to the ramp is dead. The placing of the signal lever to the proceed position energizes circuit *x*, Diagram B; and the bell, indicating proceed, is energized by circuit *y*, which is closed by the action of circuit *x* on the polarized relay. This circuit also energizes winding *B* of the electro-magnet, holding the brakes off.

The contact shoe which is supported on the frame of the locomotive beneath the cab, as shown in the illustration, is held in position by gravity, assisted by a powerful spring. It is raised vertically one inch whenever a ramp is passed over, and this movement opens the switch, which is a part of the shoe. This switch, closed, as in Fig. A, before reaching the ramp, com-



Automatic Train Control—Great Western Railway of England

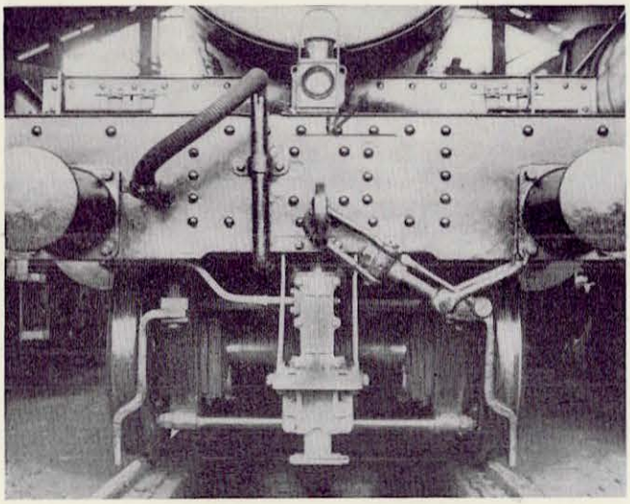


G.W.R. Locomotive Cab

pletes circuit *a* and, through winding *A* of the magnet, prevents opening of the brake valve. The opening of the switch on reaching the ramp causes the admission of air through the siren and the brake valve to the train pipe, sounding the siren and applying the brakes. This happens when an engine passes over an unelectrified ramp. The engineman, by acknowledging the warning given by the sound, can silence the siren and forestall the application of the brakes. This he does by raising a handle (shown on the outside of the box which is fixed at the engineman's side in the cab) and his act prevents the dropping of the armature of the magnet.

When the engine shoe is in its lowest position, and its switch is closed, a current of 100 milliamperes flows from the 4-volt storage battery through the 40-ohm winding *A* of the electromagnet. This holds up the armature. The armature is coupled to a hinged lever, the opposite end of which is inserted in the stem of the brake valve. When the armature drops away, the lever end lifts and causes the brake valve to open; air is drawn through the siren, which is sounded, and the vacuum is partially destroyed.

When the ramp is electrified—meaning line clear—the contact shoe is lifted as before, but the current to the 40-ohm winding of the magnet is open at the shoe switch and a current of about 500 milliamperes is picked up momentarily from the ramp. Circuit *x* is then energized through the five-ohm winding of the polarized relay and the 20-ohm winding of the electromagnet. Thus, though the shoe is lifted the air valve is not opened, the magnetic field being maintained. The polarized relay tongue closes circuit *y*, the effect of which is to ring the bell for one or two seconds.



Shoe for Automatic Train Control

When a locomotive is laid up for the night or for any time over one-half hour, the automatic cutout, shown in the upper right hand corner of the drawing, is operated by the vacuum brake system, opening the circuit of the engine battery, thus economizing battery power. When the vacuum is restored by the engineman, prior to releasing of the brakes, the cutout pulls up and again energizes the brake magnet. The engineman then silences the siren (which is revived as soon as the vacuum is restored) by lifting the resetting lever.

This system of automatic train control has been recommended for general use throughout the English railways by the special committee of the Ministry of Transport, the report of which was issued in November and was noticed in the *Railway Age* of November 27.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended January 3, which included the New Year holiday, amounted to 615,382 cars, a decrease of 160,373 cars or 20 per cent as compared with the corresponding week of last year and of 183,300 cars as compared with 1929. Reductions as compared with both years were reported from all districts and as to all commodity classifications. The summary, as compiled by the Car Service Division of the American Railway Association is as follows:

Revenue Freight Car Loading

Week Ended Saturday, January 3, 1931

Districts	1931	1930	1929
Eastern	137,325	171,372	178,128
Allegheny	120,736	156,336	161,308
Pocahontas	39,250	53,799	49,212
Southern	97,379	119,885	123,652
Northwestern	68,630	88,538	93,264
Central Western	100,159	116,159	123,765
Southwestern	51,903	69,666	69,353
Total Western Districts	220,692	274,363	286,382
Total All Roads	615,382	775,755	798,682
Commodities			
Grain and Grain Products	32,857	41,133	41,855
Live Stock	20,953	22,431	26,866
Coal	143,334	173,077	171,623
Coke	8,448	10,535	10,844
Forest Products	23,977	40,818	44,865
Ore	4,889	8,847	8,994
Mdse. L.C.L.	168,286	197,423	201,155
Miscellaneous	212,638	281,491	292,480
January 3	615,382	775,755	798,682
December 27	.....	538,419	639,389
December 20	.....	713,810	842,775
December 13	.....	744,443	922,861
December 6	.....	787,173	933,309

The freight car surplus for the week ended December 31 showed a further increase to an average of 706,538 cars, or approximately 200,000 more than in any year before 1930. This was an increase of 57,224 cars in a week and included 380,603 box cars, 251,358 coal cars, 31,355 stock cars and 15,655 refrigerator cars.

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended January 3 totaled 36,336 cars, an increase over the previous week of 1,249 cars and a decrease of 8,094 cars from the same week last year.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada		
January 3, 1931	36,336	22,156
December 27, 1930	35,087	23,240
December 20, 1930	46,805	27,189
January 4, 1930	44,430	31,247
Cumulative Totals for Canada		
January 3, 1931	36,336	22,156
January 4, 1930	44,430	31,247
January 5, 1929	46,106	30,814

Traffic Losses Shown at Motor Transport Hearing

Interstate Commerce Commission told at Chicago of severe competition from motor coaches and trucks—Regulation asked

THE Interstate Commerce Commission hearing at Chicago in Docket 23,400, Co-ordination of Motor Transportation, which opened on January 5, continued for four days, with Examiner Leo J. Flynn presiding. On Tuesday, January 6, the first Illinois Central witness was J. F. Porterfield, general superintendent of transportation, whose testimony was reported in the *Railway Age* of January 10.

The next Illinois Central witness was F. H. Law, assistant freight traffic manager, who described truck competition in Illinois Central territory and steps which the railway has taken to meet this competition. A subsidiary, the Mississippi Valley Transportation Company, provides store-door collection and delivery in connection with rail service on the Yazoo & Mississippi Valley between New Orleans, La., and Baton Rouge. This is an experimental operation, concerning the success of which no conclusions have yet been reached. The railway carries the traffic of the transportation company, the latter paying to the railway 90 per cent of the amount it receives in freight charges. The transportation company also pays to the Yazoo & Mississippi Valley 90 per cent of its net profits. All kinds of l.c.l. traffic, with certain exceptions, are handled, and the rates in effect are the same as the rail rates on the first six classes. The pick-up and delivery service is provided only at New Orleans and Baton Rouge.

Mr. Law said that the Illinois Central has encountered heavy truck competition for cotton. The trucks publish no tariffs and arrange with automobile dealers in New Orleans for return loads at extremely low rates. Less than 50 bales of cotton were moved by truck from points on the Illinois Central to New Orleans in 1929, but in August, September and October, 1930, a total of 7,221 bales moved from Illinois Central points to New Orleans by truck. The movement by truck has been partially checked by railway rate reductions.

Mr. Law expressed the belief that the universal provision of pick-up and delivery service by the railways at present rail rates would result in a loss rather than a gain in net revenue. He estimated the cost of pick-up and delivery at 13 cents per 100 lbs. The railroads should be allowed to adjust their rates to meet truck competition in specific instances, Mr. Law said. He favored regulation of both common carrier and contract carrier trucks.

Excursions Fairly Successful

The next witness, J. W. Stevenson, assistant general passenger agent of the Illinois Central, described the operations of the Central Transportation Company, a motor coach operating subsidiary in Iowa. Excursion rates, he said, have proved fairly successful in increasing passenger revenues. During the first ten months of 1929 the Illinois Central revenue from excursion traffic amounted to approximately $605,000, as compared to $827,000 in the first ten months of 1930. Excursions were operated more frequently during the latter year. As a means of determining the additional revenue derived from excursion rates, the Illinois Central operated no excursions between St. Louis, Mo., and Chicago during January and February, 1930. The increase in the sale of one-way tickets during those months, as compared with the corresponding months of 1929, was only 43, with an added revenue of $447. During the first two months of 1929 the excursion business between St. Louis and Chicago produced for the Illinois Central a revenue of $4,698. This indicated that the Illinois Central lost approximately $4,000 in gross passenger revenues during the first two months of 1930 on account of the fact that no excursions were operated.

This concluded the Illinois Central testimony, except that on the fourth day of the hearing J. M. Farrin, special engineer, took the stand to testify that a survey made in certain parts of Illinois Central territory, to determine the amount of competitive traffic moving by truck, indicated that the railway system is losing gross freight revenue in the amount of $6,885,639 a year as a result of truck competition.

A. P. Gilbert, freight traffic manager of the Chesapeake & Ohio, testified that truck competition is cutting into almost all kinds of railway traffic. The Chesapeake & Ohio has suffered a 55 per cent decrease in its merchandise car traffic. Mr. Gilbert said he had been informed that truck service offers to small shippers railway classifications, railway rates and store-door collection and delivery. Shippers with four or five tons of freight can get still lower rates under contract. The contract truck will take all classes of traffic, including coarse and bulk commodities. The rates are so low that railway rates would have to be greatly reduced if the rail rates, including the cartage charge at the terminals, were to meet the truck rates. Motor trucks are the most important competitors of the railways, said Mr. Gilbert, with respect to both car load and l.c.l. traffic.

Passenger Traffic Still Decreasing

T. H. Gurney, passenger traffic manager of the Chesapeake & Ohio, said that in spite of improvements in train service, excursion rates and new equipment, passenger revenues on the Chesapeake & Ohio were 21.9 per cent less in 1930 than they were in 1929. Mr. Gurney admitted certain advantages of motor coaches, but said that they should be regulated. Questioned by the examiner, he said that the Chesapeake & Ohio had considered the substitution of motor coach service for local train service, but had found that the head-end traffic in Chesapeake & Ohio territory was too heavy for motor coaches to handle. He said that the railway had not felt justified in operating both motor coaches and motor trucks to handle the various kinds

of traffic now moved by local passenger trains. In answer to another question, he said that motor coach fares in his territory range from one to three cents a mile.

The next witness was C. M. Cheney, president and general manager of the Waterloo, Cedar Falls & Northern. This company is operating motor coaches to supplement and replace certain of its electric train service. Mr. Cheney said that the motor coach operation has been confined to the territory of the railway, first, because the company did not want to invade the territory of any other road, and, secondly, because there is no money to be made in motor coach operation in Iowa. He said that it is necessary for a railway to operate motor coaches in order to keep out competitors.

R. R. Valier, vice-president and general manager of the LaCrosse & Southeastern, testified that his company has lost 25 per cent of its l.c.l. traffic in the last five years. The company operates a motor truck service out of Viroqua, Wis., as a feeder for the railway line, and this operation has been profitable. The railway operated motor coaches for several years, but found that they are not successful in holding passenger traffic. Two motor coach lines between LaCrosse and Viroqua are now doing business of less than $2,000 a year, which is 25 per cent of the 1926 common carrier traffic between these points and 16 per cent of the 1920 traffic, all of which was handled in that year by the LaCrosse & Southeastern.

The next three witnesses were independent motor truck operators. H. C. Kelting, president and general manager of the Central Truck Depot, Inc., at Louisville, Ky., described the motor truck operations radiating from his terminal. He said that they serve many points which are not on railways. He testified that truck rates are generally higher than rail rates, and said that regulation of interstate truck lines is necessary, but should only cover financial responsibility and not schedules and rates. Regulated truck transportation will eliminate many private trucks, according to Mr. Kelting. He said that the competition which is cutting most deeply into railway traffic is from the trucks operated privately by industrial concerns. Tom Snyder, president of the Warehouse Distributing Corporation and the Central Union Truck Terminal of Indianapolis, Ind., was the next witness. His company operates 14 warehouses in Indiana, from which truck lines radiate, giving same day or next morning store-door delivery over a wide territory. These truck lines deal exclusively with forwarding companies, the traffic coming into the warehouses in carloads and continuing to destination by truck. Louis Cohen, manager of the National Poultry & Refrigerator Express of Knoxville, Tenn., described the movement of poultry by truck, and argued against regulation of truck lines.

Trucks Prove Useful

The next four witnesses appeared for the New York Central and its associated lines. R. P. Gribben, assistant superintendent of freight transportation of the New York Central, described contracts which the railway has with independent truck operators, under which trucks are used to move l.c.l. freight between stations on the New York Central. The truck service is merely a substitution for rail service, its advantages being that it reduces time in transit and enables the railway to reduce its operating expenses. W. J. O'Brien, general manager of the Chicago River & Indiana, the Chicago Junction and the Indiana Harbor Belt, testified that his company has a contract with one truck operator for the transportation of l.c.l. freight between the Gibson transfer house and the New York Central freight station at Calumet, Ind. He said that this service is economical and expeditious, the movement by rail between these points involving a six mile haul and the truck movement a haul of only three miles. D. J. Hackett, superintendent on the Michigan Central at Jackson, Mich., testified that the Michigan Central has two contract truck routes at this time, and F. L. Foster, assistant superintendent of freight transportation of the Pittsburgh & Lake Erie, said that his company has two similar routes.

A. W. Towsley, assistant to vice-president of the Chicago, Rock Island & Pacific, was the first witness on the third day of the hearing. He testified concerning motor coach and truck lines competitive with the Rock Island, and filed exhibits describing these companies in detail. He also described changes in the operations and traffic of the Rock Island, saying that there was a 79 per cent decrease in passengers carried intrastate in 1929, as compared with 1919, and a 53 per cent decrease in passengers carried interstate. Taxes paid by the Rock Island have increased 37 per cent in the last ten years. Mr. Towsley filed a statement showing the estimated amount of taxes paid by railroads in various western states for highway construction and maintenance. This indicated that 5.68 per cent of railway taxes go for highway construction and maintenance in New Mexico, and 29.92 per cent of railway taxes go into the highways in Louisiana, these representing the two extremes among the states mentioned. Rock Island taxes in 14 states amounted to $6,567,594 in 1929, Mr. Towsley testified, and of this amount $1,066,853 was spent in highway construction and maintenance.

The next Rock Island witness was L. M. Allen, vice-president and passenger traffic manager. He said that the loss of passenger revenue has been confined largely to day coach traffic. Motor coach operation is apparently not always profitable, said Mr. Allen, but the amount of traffic carried in the motor coaches is substantial. He testified that motor coach rates range from 1⅓ to 3 cents a mile, but that rates are reduced for special purposes on short notice, this being an advantage of the motor coach lines over the regulated railway lines. Mr. Allen said that the Rock Island has resorted in a number of instances to rail motor car operation in order to reduce expenses while meeting its obligation to provide transportation for mail and express traffic. The public should be interested in the effect of motor vehicle competition upon the railways, Mr. Allen said. The railways cannot continue to meet their transportation obligations if the inroads into their traffic are continued. He said that the railroads ask only that their competitors stand on their own feet, not capitalizing the tax contributions of the public.

Regulation of Rates Needed

As remedies of the situation, Mr. Allen suggested regulation to control the rates of the motor vehicle lines. In competing with motor coaches, the Rock Island has had difficulty determining what the rates of its competitors are. Motor coach rates, he said, should be governed by the cost of service, regardless of the corresponding railway fare. Motor coach fares should provide a profit for the operator over these costs; user proportion of the interest charges on the public investment in the highways; user proportion of highway maintenance costs, including depreciation; interest on the value of motor vehicle equipment operated; and cost of operation.

In response to a question of Examiner Flynn, Mr. Allen said that the Rock Island had given consideration to the substitution of motor coach service for train service, but was unable to find places where this could profitably be done. Asked if lower rates would create more business for the railways, Mr. Allen said that excursion rates have been tried with some success, but that he did not know what effect a reduction of the basic 3.6 cents a mile rate would have. Mr. Allen was questioned at length by counsel for an independent motor coach line concerning the railways' loss of passenger business prior to 1925, when there were few motor coach lines in operation, and also on his knowledge of motor coach taxes and on the practices of motor coach lines with respect to changes in rates and schedules. Questioned about the three classes of rates which have been put into effect by a number of the western lines, Mr. Allen said that their purpose is to increase railway passenger revenues.

Arthur Mackenzie, vice-president and freight traffic manager of the Rock Island, testified that the road had lost a considerable amount of freight tonnage to motor trucks, particularly l.c.l. traffic moving over distances of 125 miles, more or less. He said that the drainage of railway revenues was interfering with the rendering of good service. Trucks should be regulated and their rates should be published and left unchanged except after proper notice, according to Mr. Mackenzie. The lack of a stabilized rate structure applying to the truck lines is indicative of the need for federal regulation, he said.

In reply to a question put to him by Examiner Flynn, Mr. Mackenzie said that the Rock Island had considered the provision of store-door collection and delivery service, but had taken no action as yet. He said that there is a difference of opinion among the officers of the Rock Island as to the advisability of such action. He described the truck operation carried on by the Rock Island in Chicago, which replaces trap car movement. Traffic is attracted to trucks, said Mr. Mackenzie, because of the store-door service, lower rates and lighter packing requirements.

Better Service, Less Traffic

E. P. Cockrell, general passenger agent, was the first witness for the Chicago, Indianapolis & Louisville. He testified that the number of passengers carried by the Monon decreased 78 per cent between 1920 and 1930. Between Chicago and Indianapolis, a distance of 184 miles, the Monon has lost 75 per cent of its day coach business in spite of the fact that four trains each way are still operated daily, better equipment is provided, and more people are traveling. Motor coaches are carrying four times as many passengers as all the railways operating between Chicago and Indianapolis are carrying in their day coaches, he said. Mr. Cockrell told of the organization of the Monon Transportation Company to operate motor vehicles in replacement of unprofitable local train service. It is expected that two routes will be established within two or three months. In reply to a question from the examiner, Mr. Cockrell said that the train time between Chicago and Indianapolis is about 4½ hours, while the time by motor coach is approximately 6 hours. He said that the motor coach lines are not feeders to the railway.

The next witness for the Monon was J. R. Van Delinder, general freight agent, who said that the local livestock and merchandise traffic of the railway has practically disappeared as a result of truck competition, and that the merchandise traffic moving longer distances has been greatly reduced. Trucks, he said, are carrying coal from the Indiana coal fields to points as much as 50 miles distant. Other commodities which have left the railway for the truck are drugs, tires, radio cabinets, automobiles, paper, meat, eggs, furniture and books. Replying to a question, Mr. Van Delinder said that trucks attract traffic on account of their rates, service, packing requirements and their ability to give carload rates on smaller shipments.

C. C. Hine, general solicitor of the Monon, testified that the railway paid $861,612 in taxes in Indiana during 1930.

The last witness on the third day of the hearing was H. H. Hyland, president of the Interstate Trucking Company, an independent concern operating 100 trucks and trailers out of Chicago. This company works closely with forwarding companies and operates both as a common carrier and a contract carrier. The witness testified that his company paid 12 per cent of its gross earnings in taxes.

On the fourth day of the hearing, the first witness was H. W. Johnson, controller of the Chicago, Burlington & Quincy. He filed exhibits showing competitive motor coach and truck lines in the territory of the Burlington, the Colorado & Southern, the Ft. Worth & Denver City and the Wichita Valley. He also filed exhibits showing passenger and freight traffic and operating statistics of the railways and the Burlington Transportation Company, a motor coach operating subsidiary.

Motor Coaches Save Money

The next witness was W. E. Fuller, assistant to the executive vice-president of the railway and vice-president of the Burlington Transportation Company. The transportation company, he said, operates motor coaches over 1,024 miles of routes parallel to the Burlington railway lines. The purpose of the operation is to replace train service, and the Burlington has abandoned the idea of engaging in long-haul motor coach service. As a result of this motor coach operation, the Burlington is saving $117,163 a year in train operating expenses. Motor coach and train schedules are staggered, and railway tickets are honored on the motor coaches. In reply to a question from Examiner Flynn, Mr. Fuller said that the motor coach operation is not profitable in itself, but is profitable to the railway on account of its permitting the reduction of train service. The Burlington has not gone into the trucking business, he said, because a study indicated that this would not be profitable on account of existing trucking conditions with respect to rates.

The next witness for the Burlington was A. Cotsworth, Jr., passenger traffic manager. He said that there had been a reduction of 73 per cent between 1920 and 1929 in the number of passengers carried on the Burlington. The average haul per passenger increased 76 per cent, the decrease in the number of passengers carried being in the short haul traffic which paid the full 3.6 cent rate. Taking a specific line, Mr. Cotsworth said that the railway traffic moving between Peoria, Ill., and Galesburg in 1930 was 21.7 per cent of that carried in 1921. He estimated that 22 per cent of the travel between Peoria and Galesburg is now by rail, 16 per cent by motor coach and 62 per cent by automobile. To meet motor coach competition, the Burlington has offered special party service and excursion rates. The reduced rates have brought more traffic but less money, the number of passengers declining steadily with the increasing popularity of the private automobile.

George A. Hoffelder, assistant general freight agent of the Burlington, was the next witness. He filed an

exhibit showing that the l.c.l. freight traffic handled was 20 per cent less in 1930 than in 1929, while the carload traffic was 11 per cent less. L.c.l. freight traffic originated on the Burlington in 1929 was 59 per cent of that originated in 1916, while the carload traffic originated in 1929 was 118 per cent of that originated in 1916. In making a survey of truck competition, Mr. Hoffelder said that he was helped materially by the shipping public, a number of shippers expressing the hope that the railways would engage in truck operation so that shippers might have responsible carriers to deal with. Of the l.c.l. traffic moved by the Burlington from Omaha in a three day period, 3 per cent moved between 1 and 50 miles, 17 per cent between 51 and 100 miles, 20 per cent between 101 and 150 miles, and 60 per cent over 150 miles. Mr. Hoffelder produced advertisements of independent truck lines indicating the wide extent of their operations.

Regulation Needed

W. G. Bierd, receiver of the Chicago & Alton, testified in favor of regulation of the motor vehicle lines. Highway traffic must be regulated, he said, for the protection not only of railway traffic but also the traffic of the highway lines themselves. Traffic losses suffered by the railways have threatened the continued existence of railway properties, he continued. The railroads must secure more revenue from the remaining users of railway transportation in order to make up the losses to their competitors. Federal control is necessary to unify the practices and regulatory measures in effect in the several states, he said, blaming the present confusion and instability of motor transportation upon the lack of federal regulation. Instead of trying to reduce train service, the Alton has increased it. The company ran the greatest number of scheduled passenger trains in its history in 1927, 1928 and 1929, but did not succeed in preventing further losses of passenger business. The railways, said Mr. Bierd, must engage in motor coach and truck operation, and the Alton is already operating motor coaches and intends to enter the truck field.

The last railway witness was Frank E. Webster, general freight agent of the Chicago & Eastern Illinois. He filed exhibits showing in detail the trend of passenger traffic on the C. & E. I., comparisons of railway and motor coach fares, and similar items. Mr. Webster said that a test last May showed that the average daily traffic between Chicago and St. Louis consisted of 524 passengers who traveled by motor coach and 142 passengers who traveled by train.

The hearing adjourned following the testimony of several representatives of independent truck lines. It was resumed at St. Paul, Minn., on January 12.

* * *

A Canadian Pacific Train at Franz, Ont.—Algoma Central & Hudson Bay Connection on the Left

Four-System Consolidation Plan

WASHINGTON, D. C.

A VIGOROUS defense of the President's action in bringing about an agreement of the eastern railway executives on the consolidation plan to be submitted to the Interstate Commerce Commission, and an expression of approval of the general plan as outlined by the railways, was made by Chairman Parker of the House committee on interstate and foreign commerce in a speech in the House on January 8.

"Now, what has the President of the United States done?" "He found the leaders of these four systems unable to agree as to the proper allocation of the smaller properties. There are a few strategic properties which two or more of these systems want. There are several weak properties which none of them want. It is a case of some wanting the best and others wanting to wish off on competitors the less profitable lines. Again and again during recent years negotiations looking to a solution of these problems have failed. Through the good offices of the President, an understanding has been reached.

"Now, that does not mean that the President has passed upon the public interest involved. He has merely set in motion conferences which will bring to the Interstate Commerce Commission proposals for them to examine as to whether or not they are in the public interest. The President has not blocked out any four systems. These systems have grown through the past 100 years. Any intelligent person can take the railroad map of official territory and can predict where 90 per cent of the mileage will fall in any well-reasoned grouping.

"According to the agreement as reported having been conveyed to the Interstate Commerce Commission, the Baltimore & Ohio will bring in an application for the Commission's approval for a system of, say, 11,156 miles of main track; yet the Baltimore & Ohio now has 5,689 miles. The New York Central will bring in an application for, say, 12,920 miles of main track. The New York Central now has 11,793 miles. The Pennsylvania will bring in an application for 16,548 miles. The Pennsylvania already has 11,285 miles. The Chesapeake & Ohio-Nickel Plate will apply for control of, say, 12,554 miles. They already have 9,506 miles.

"Now, what is really involved in the preparation of these applications? It is the allocation of these properties so that the four great systems in the East will be more nearly equal in strength and in opportunity, and so as to assure adequate service over many of the short lines. Without these applications what do we have? Suppose nothing is done, what is the result? We still have four great systems in the East.

"If you call a big railroad system a Frankenstein, there are already four of them in eastern territory, but at present these systems are of unequal size and are not equal as to opportunities. They are not of as equal strength as the public would like. They do not have that equality of opportunity which would assure the competition among them that would bring in the end the best service to the shippers. And moreover, if left alone these four systems will continue to operate as they are and about 50 other little railroads will continue to operate as they are, until some of them can obtain from the commission authority to suspend operations.

"Those who are accusing the President of the United States of usurping the authority of the commission should be specific and state what systems he has ap-

proved. He has not yet approved anything. He has not announced any systems. He is concerned that there should be action where delay may bring impaired railway service. In suggesting action he has merely brought the railway executives to do what the country has been wanting them to do for 10 years; that is, to come to the commission with their applications and ask the commission to pass upon them in the public interest.

"The president has been accused of dictating to the commission, and it is openly declared that he will influence those whom he has appointed. There is not one scintilla of evidence sustaining this unfair and unjustified accusation. Not having any preconception as to what properties should go into what system, how could the President of the United States be interested in the particular allocation of any individual short line or smaller railway property?

"The railroads of the East are holding up investments of vast sums because they do not know what the outcome as to final unification may be. They can not know that until they themselves come to the commission and ask authority to make definite acquisitions. Heretofore they have not been coming. Each has been afraid of the other apparently. Now it has been brought about that they all agree to come and to put an end to this delay and this uncertainty, which is tying up hundreds of millions of dollars of credit which otherwise would be released to buy materials, to employ men, to make our transportation systems more adequate and more serviceable."

Mr. Parker put into the Congressional Record in connection with his address a table giving the mileage, investment, revenues, expenses, net income and ton-miles and passenger miles for each of the roads mentioned in the railway executives' outline of the four-system plan, and showing the additions to these figures to be made by the roads proposed to be acquired, for the year 1929.

According to this table the Pennsylvania system would not only have the greatest mileage but also a property investment greatly exceeding that of any of the other systems, a total of $3,333,223,624, as compared with $2,487,589,546 for the New York Central, $2,374,932,888 for the Chesapeake & Ohio and $1,970,976,938 for the Baltimore & Ohio. The greatest addition to the mileage would be in the case of the Baltimore & Ohio, which would gain 5,466 as compared with the mileage now operated, while the P.R.R. would gain 5,263.

The proposed Pennsylvania system would also have the greatest net railway operating income, $205,687,215, as compared with $128,915,290 for the New York Central, $113,219,377 for the Chesapeake & Ohio, and $89,948,511 for the Baltimore & Ohio. The table does not include a number of short lines to be acquired nor the properties to be owned jointly by the systems.

Senator Brookhart on January 8 reintroduced in the Senate two bills which he also introduced in the last Congress, one to prohibit consolidations except of roads extending from coast to coast and the other to direct the Interstate Commerce Commission to acquire a line of railroad from coast to coast and "by proper competition, to stop these bubbles of stock speculation." Referring to the increase in stock prices up to 1929 he said: "Now we have coming a gigantic stock-jobbing railroad merger to sustain this volcano and bubble, on which there can be built up a bigger one, so that there will follow in due time another one of these explosions."

The "progressives" do not always hang together, however, and Senator Couzens announced that he was opposed both to government ownership and to any coast-to-coast merger, on the ground that "railroad management should be closer to the people than would be possible under a transcontinental system under one head." Senator Couzens also replied to what he called newspaper misinterpretations of his criticisms of the President, saying: "Obviously, I did what I could to offset the influence of the President with the Interstate Commerce Commission. I do not believe the President or members of Congress should try to influence the action of an independent commission. I did not commit myself with regard to the proposed merger when I criticized the President's statement."

Northerns' Merger Off

THE Great Northern and the Northern Pacific have abandoned for the time being their plan to combine the two properties and have notified the Interstate Commerce Commission to this effect. A joint statement of Charles Donnelly, president of the Northern Pacific, and Ralph Budd, president of the Great Northern have made public the following statement in connection with a circular addressed to depositors of stock of the two companies:

"The Commission in its final consolidation plan December 9, 1929, placed the Northern Pacific and the Great Northern in the same system and made the Burlington the nucleus of a separate system. At that time there was pending an application for the unification of Great Northern and Northern Pacific, and on February 11, 1930, the Commission decided that such unification would be in the public interest and authorized it, but only on the carrying out of certain conditions. One of these was that the northern lines should relinquish their control of the Burlington. The Commission indicated that the question of allowing the unified northern lines access from Twin Cities to Chicago (presumably via the Burlington) would, if such access were applied for, be considered in connection with the plan to be submitted for the segregation of the Burlington system.

"The applicants spent much time and study on possible ways of making an effective and acceptable segregation of the Burlington, with full protection of the stockholders of the northern lines, and of vesting in the unified northern lines control and operation of the Burlington between Twin Cities and Chicago. Until recently we had hoped that a satisfactory plan of doing this could be worked out; but it has become apparent that under present conditions a segregation of the Burlington could not be carried out so as to promote the welfare of the carriers involved or appeal to their stockholders as being in their interest or in the public interest. A motion therefore will be made to dismiss the applications.

"The rail situation in the northwest needs relief. The rail carriers have already made virtually all progress practicable in the direction of increased economy and efficiency. The only way to obtain still further substantial economy and efficiency is through railroad combinations which would not interfere with the preservation of ample rail competition. There is much greater intensity of transcontinental rail competition in the northern tier of states between the Great Lakes and the Pacific Coast than there is either in the central or the southern zone of the western states. The unification of the two northern lines would still leave ample rail competition—more, in fact, than exists in either the central or southwestern zone. That the public interest would not be impaired by such elimination of incidental competition as would arise from this unification is strongly emphasized by the rapid development of additional forms of competition, by automobiles, autobuses, auto trucks, and pipe lines for natural gas and even for gasoline, which,

on the one hand give the public the benefit of controlling forms of competition not known until recently and, on the other hand, operate to reduce railroad traffic very largely and hence accentuate the urgent need for further reduction in railroad transportation costs. The plan proposed by us met fully the condition of preserving ample competition; the plan as modified by the Commission also met it; and were it not impracticable at this time to carry through the plan of assuring an independent Burlington system, we should have submitted to the Commission reasons more convincing than ever why the unification of the northern lines should be authorized. We should have submitted also convincing evidence that, in general, our present employees would not have suffered substantial loss from this unification. The difficulty to which we have already referred, of effecting the segregation of the Burlington under present conditions, seems to us, however, to be insurmountable.

"We have been reluctant to withdraw our application because it cannot be too strongly emphasized that the problem is one of deep concern not merely to the transportation industry, but to all business and agricultural interests as well of the northwest."

F. T. C. Reopens Reciprocity Hearings

HEARINGS on Federal Trade Commission Docket No. 1779, charging the Waugh Equipment Company, Buffalo, N. Y., and Arthur Meeker, F. W. Ellis, and J. B. Scott, all officers of Armour and Company, the packers, with the use of Armour traffic to stimulate sales of draft gear manufactured by the Waugh Equipment Company, were resumed in New York on January 12, following adjournment since hearings were concluded at Chicago on June 28, 1930. During the adjournment, a ruling was secured from the commission admitting as evidence certain documents presented and marked for identification at earlier hearings. This second series of hearings was opened by the presentation by government attorney E. F. Haycraft of additional exhibits previously received, and now admitted as evidence by Examiner E. M. Averill on the basis of the Commission's ruling. These consisted of statements from the Boston & Maine, the New York, New Haven & Hartford, the Delaware, Lackawanna & Western and the Lehigh Valley, of shipments of Armour traffic, and draft gear purchases. According to them, carloads "shipped by or to Armour and Company via the Boston & Maine to or from destinations or points of origin competitive with other roads or routes" amounted to 1,344 in 1926; 2,252 in 1927; 2,425 in 1928; 2,888 in 1929, and 905 in the first four months of 1930. Similar shipments over the Lackawanna totaled 5,808 in 1925; 6,437 in 1926; 7,180 in 1927; 7,041 in 1928, and 6,736 in 1929. The Boston & Maine's total purchases of draft gear for all purposes from January 1, 1924, to May 1, 1930, were 13,320½ car sets, of which 1,326½ sets were purchased from the Waugh Equipment Company. During the same period, the D., L. & W. specified a total of 1,750 Waugh gear, all for use on new cars. Another exhibit showed that the Waugh Company had competed unsuccessfully for orders on additional cars, although their prices were in line with those of other manufacturers. A New Haven statement showed that that road, in the period mentioned above, had ordered draft gear amounting to 13,584½ car sets, of which 511 sets were obtained from the Waugh Equipment Company; while the Lehigh Valley records revealed that Waugh gear had been specified on 250 out of 1,200 cars ordered in 1926 and on 600 out of 1200 ordered in 1929.

Holden and Droege Testify

The first witness to be called was Hale Holden, chairman of the executive committee of the Southern Pacific and for about 14 years prior to January 1, 1929, president of the Chicago, Burlington & Quincy. Questioned as to the purchasing policy in force during his presidency of the Burlington, Mr. Holden said, "I had no policy except to buy on merits. We did not adhere to a single standard, but invited competition to obtain the best materials and prices." He testified that he had known Mr. Meeker, one of the respondents, for many years, and identified a file of correspondence between himself and Mr. Meeker, asking that the C., B. & Q. try out Waugh gear, which was added to the record. This correspondence, dated during the latter part of 1927 and early in 1928, included some interoffice correspondence on the Burlington, all related to negotiations for the purchase of Waugh draft gear. It indicated that this gear had been tested by Burlington mechanical officers, and then applied to 135 new freight cars and a few new baggage cars.

Testifying further in regard to this correspondence, Mr. Holden stated that it was the policy of the Burlington to make a fair test of any new or improved device which might be brought to its attention in any way, and that the volume of traffic offered by a manufacturer would naturally be considered in making purchases, provided the quality and price of his product were satisfactory. Asked if traffic had been discussed in connection with the purchase of Waugh gear mentioned above, Mr. Holden replied, "No. I did not think a small matter such as this would affect the relations between Armour and ourselves. I knew that our competitors were using or considering Waugh gear and I did not see what we had to gain by such a small purchase."

Mr. Holden was followed on the stand by J. A. Droege, vice-president and general manager of the New York, New Haven & Hartford. Mr. Droege testified that he had nothing to do with the Waugh gear until early in 1929, when he was told by President J. J. Pelley that the Waugh company felt it was not receiving fair treatment from the New Haven, and was asked to investigate the Waugh gear. This request resulted in a conference on draft gear in Mr. Droege's office on May 3, 1929, at which a number of the road's mechanical and traffic officers were present. At the close of this meeting, Mr. Droege said, he told H. M. Ransom, vice-president of the Waugh Equipment Company, that the New Haven, in buying accessories, wanted safety, stability, low first cost and maintenance, and traffic, in the order named. He gave his conclusions from this conference to be that New Haven officers generally favored the Miner gear, which had been standard on the road and with which they had had experience. Mr. Droege also testified in regard to correspondence between other officers and directors of the New Haven and officers of the Waugh Equipment Company.

The first day of the New York hearings was concluded with the appearance of C. J. Brister, vice-president of freight traffic of the New York Central, and C. A. Blood, assistant vice-president, traffic, Lehigh Valley. Both testified in regard to correspondence between the individual respondents in the case and other officers of their respective roads, and stated, on cross-examination, that they themselves had never discussed traffic with

Messrs. Meeker, Ellis and Scott nor with any officers of the Waugh Equipment Company.

Traffic Considerations Weighed

Horace Parker, president of the Bradford Corporation, the first witness to appear on the second day of the hearing, testified that it was the custom of his company, in selling draft gear, to approach mechanical and operating officers, and then, if asked to bid, to negotiate with the purchasing department; and said that gear for service or laboratory tests were frequently required. In 1924, Bradford gear had been included in specifications on some 31 roads. Competition from the Waugh Equipment Company, he said, first became important about 1926, chiefly on the Missouri Pacific, but by 1927 such competition was met with on almost all the roads to which Bradford had formerly sold—mainly on the B. & M., D. L. & W., L. V., S. A. L., M. P., and C., R. I. & P.

A statement of his company sales from 1924 to 1930, inclusive, which Mr. Parker produced for the record, showed a steady decline, except for a slight upturn in 1929. Questioned as to the reason for this condition, the witness answered "Competition," but his reply to the question "What competition?" was stricken from the record on objection by E. M. O'Bryan, counsel for respondents. Most of this competition, Mr. Parker added, came from the Waugh, Miner and Cardwell companies; and, from the first-named company resulted in reducing Bradford's share of the Missouri Pacific business from 85 per cent in 1924-1925 to about 50 per cent in 1929. When asked the reason for this loss of business, he said, "Knowledge received from our representatives on the ground led us to believe that traffic caused us to lose this business," and answered "Yes" when the question was rephrased by Examiner Averill to read, "Knowledge received from your representatives caused you to believe that the Missouri Pacific was weighing traffic considerations in allotting its draft gear business." Mr. Parker was unable to recall, however, that he received any information from his representatives as to the sources of this traffic.

He gave similar testimony concerning sales to the Chicago, Rock Island & Pacific, stating that competition from the Miner, Waugh, Cardwell and later the Durable gears had caused his company's proportion of that road's business to decline from 50 per cent in 1924-1925 to five per cent in 1929. Asked about the nature of the competition he gave the same answer as to a similar question about sales to the Missouri Pacific. He then gave it as his belief that the Miner gear had no traffic behind it, but said the Durable gear was supposed to have been supported by traffic; and that the Cardwell and Waugh gears were supposed to be supported respectively by traffic of the Grigsby-Grunow and Armour companies. Mr. Parker was then questioned as to his company's sales to a number of other railroads, but stated that the Seaboard Air Line was the only other one on which they felt their business has declined as a result of traffic considerations. Competition on this road was mainly from the Miner, Cardwell and Waugh gears.

On cross-examination, the witness testified that, although Armour and Company ship much traffic over all railroads and to all parts of the United States, the Bradford Corporation had never met competition from this source except in the specific instances previously noted. He added that competition for draft gear sales had been particularly intense since 1926, and that a decrease in the business of any manufacturer might be due to various reasons, such as failure of their regular customers to buy new cars or changes in mechanical officers.

The afternoon session was opened with D. I. McKay, president of the Standard Coupler Company, makers of the Sessions gear, on the stand. He stated that it was his company's policy to submit bids for draft gear when asked to do so, and to have on hand when the sale was closed a representative authorized to amend prices. He agreed with Mr. Parker that his company had first met serious competition from the Waugh gear in 1925 and 1926, and added to the record a statement of sales from 1924 to date. Questioned concerning the reason for the decline in sales of Sessions gear revealed by this statement, he replied that reports received from his salesmen led him to believe that they were influenced to some extent by so-called traffic considerations, but was unable to say to what extent this was true. Early in 1930, he said, when the Seaboard Air Line was in the market for new cars, his company submitted what they considered "a most attractive offer," but got none of the business. Mr. McKay's further explanation of this transaction was stricken from the record on objection by Mr. O'Bryan. On additional examination, the witness said that his company sold its gear only on quality and price, but that "we have felt it necessary to bid lower than we have ordinarily felt to be justified in order to overcome considerations other than price and quality on the part of competitors." He added that among such factors he recalled traffic, and that among the competitors involved were Waugh and others.

On cross examination, Mr. McKay admitted that sales of Sessions gear had been much larger before 1924 than since that date; that since that time they had sold no gear to the Seaboard Air Line, and that the particular Seaboard order mentioned above had been divided between Cardwell, Waugh and National. He supported previous testimony from Mr. Parker to the effect that competition for draft gear sales has been much keener since 1926 than before that date; that many factors may enter into the cost or sales of draft gear, and that personal contact between the heads of companies making draft gear and railroad presidents or other high officers is not at all uncommon.

The hearing of January 13 was concluded with the appearance of J. H. Eicker, auditor of the Westinghouse Air Brake Company, who presented a statement of the draft gear sales of that company prior to the time of its consolidation, for sales purposes, with the Cardwell Draft Gear Company in the fall of 1929; and of F. W. Kraeger, associate editor of the *Railway Age*, who presented figures on freight car orders from 1924 to 1930, inclusive.

Ellis Informed of Negotiations

The New York hearings were concluded on Wednesday, January 14, when H. M. Ransom, vice-president of the Waugh Equipment Company, was called to the stand. Mr. Ransom, after describing his efforts to sell Waugh gear to mechanical officers of the Boston & Maine in 1926 and 1927, identified a letter from F. W. Ellis to George Hannauer, then president of the B. & M., which Mr. Ransom said had been given him by A. J. Pizzini, president of the Waugh Equipment Company, as an introduction to Mr. Hannauer. He testified that he described the Waugh gear to Mr. Hannauer and asked that he arrange for a test of it, with the result that some of these gear were subsequently purchased. A number of Mr. Ransom's reports on these negotiations were then added to the record, after which he was questioned about a letter from himself to President Hannauer which had been accepted as evidence at an earlier hearing in Boston, Mass., and in which Mr. Ransom said, "I am awaiting advice from you as to the next move to make. I immediately wired our mutual friend after leaving you yesterday." Asked to

whom the phrase "our mutual friend" referred, he replied, "F. W. Ellis," but later said that he actually notified Mr. Pizzini who, in turn, informed Mr. Ellis that the Boston & Maine was willing to consider Waugh gear. The witness concluded testimony concerning his contact with the B. & M. by describing negotiations in the fall of 1928 when, after reducing its original bid, the Waugh company received orders for gears for 250 out of 500 cars purchased at that time. The remainder of his direct testimony was confined to a less detailed description of similar negotiations with the New York, New Haven & Hartford and the Erie.

On cross examination, Mr. Ransom described the sales resistance encountered on various roads, stating that he often ran into difficulty because one of his competitors told mechanical officers that the Waugh Company was ignoring them and trying to do business by working through other departments. In such cases, he said, he tried to obtain the confidence of mechanical officers and to persuade them to make or witness tests of the Waugh gear. He sold, he added, on merit and price; and testified that he had never introduced the subject of traffic in talking with railway officers, and had never promised an increase of Armour traffic in return for purchases of Waugh draft gear.

Railway Legislation Slighted

(Continued from page 192)

company investigation and the Couzens resolution to halt consolidations pending further legislation. The holding company investigation has been carried on by a subcommittee and, more particularly, by the experts working under the direction of Dr. W. M. W. Splawn, but it is understood that the sub-committee will not be able to report for some time yet so it appears unlikely that the committee will be able to do much toward framing a bill on the subject during the short session. No bill has yet been introduced and one of the tasks before the subcommittee is to study out some way in which the regulatory functions of the commission could be extended to holding companies.

Senator Couzens' resolution to halt consolidations was passed readily enough in the Senate, where to many it doubtless appeared as merely a proposal to delay matters for a year, but action on it was delayed in the House while the committee consumed most of the remaining days of the session in reporting out a greatly modified resolution. Now the date for the expiration of its provisions, March 4, is only six weeks away and practically nothing has been done toward the further consideration of the permanent legislation which it contemplated. There was some talk to the effect that Senator Couzens would try to press its passage, with a date a year later, in an effort to hold up the proposed eastern consolidation plan, but the occasion which had attracted the most support for the resolution was removed when the Great Northern and Northern Pacific officially announced the withdrawal of their unification plan on January 9.

There has been some vociferous objection to the eastern consolidation plan by individual members of Congress but not enough to forecast any action by that body to interfere with its handling by the commission under the law as it exists. After the commission has passed upon the numerous details of the plan, on applications for authority to acquire control of the various properties involved, serious attention may be given to the legislation necessary to make possible the further step of actually consolidating the proposed systems.

Looking Backward . . .

Fifty Years Ago

The Rochester & State Line [now part of the Buffalo, Rochester & Pittsburgh] was sold at Rochester, N. Y., on January 8 under foreclosure of mortgage and was bought for $600,000 by a committee of bondholders. The road extends between Rochester and Salamanca, 108 miles.—*Railroad Gazette,* January 14, 1881.

The Denver & Rio Grande [now the Denver and Rio Grande Western] has contracted for the construction of 144 locomotives with a single builder, the cost to aggregate about $1,000,000. This is probably the largest contract for locomotives ever made, and is an evidence of the rapid growth of this remarkable narrow gage enterprise.—*Railway Age,* January 20, 1881.

The locomotives recently built for the use of the Bound Brook line of the Reading are the heaviest ever built in this country for fast passenger service. These are of the American type and have a total weight of 96,200 lb. with a weight per driving wheel of more than 16,000 lb. The locomotives are equipped with the Wooten type boiler for burning anthracite coal.—*Railroad Gazette,* January 14, 1881.

The war in passenger rates, which has raged for several months between the roads leading from Chicago and St. Louis to Missouri river points, has finally been ended by the agreement of the Wabash, St. Louis & Pacific [now the Wabash] to abandon its claim for a differential of $1 from Chicago. Innumerable meetings have been held and short-lived agreements have been made only to be rescinded; but on January 18 the misunderstandings seem to have been settled. The roads all agreed to advance the rate between Chicago and St. Louis to $4.70, and between Chicago and Kansas City to $7.50.—*Railway Age,* January 20, 1881.

Twenty-Five Years Ago

H. W. Byers, general agent of the freight department of the Chicago & North Western at Chicago, has been promoted to assistant general freight agent at that point.—*Railway and Engineering Review,* January 20, 1906.

The Central of New Jersey has received from the builders three exceedingly heavy locomotives for passenger service. They are of the eight-wheeled American, or 4-4-0 type, and are interesting from the fact that comparatively few large engines of this character are now being built for the railroads of the United States. They were designed for hauling a light train over a very crooked division where the grades are heavy between Bethlehem, Pa., and Scranton. The total weight is 158,000 lb., with a weight per driving wheel of 27,000 lb. They are equipped with Wooten type boilers.—*Railroad Gazette,* January 19, 1906.

Ten Years Ago

H. W. Miller has been appointed vice-president of the Southern in charge of operation.—*Railway Age,* January 14, 1921.

A bill to make the Transportation Act provide clearly and specifically what the railroads and the Interstate Commerce Commission have contended it already contemplated, but which the Comptroller of the Treasury and Supreme Court of the District of Columbia have said it does not provide, that is, partial payments to the railroads on account of their guaranty for the six months after the termination of federal control, was introduced in Congress on January 6. If the bill is passed it will enable the railroads to collect a large part of the $300,000,000 or $400,000,000 of their guaranty that is due, without waiting for the long and tedious process of final adjustment of the exact amounts.—*Railway Age,* January 14, 1921.

Communications and Books . . .

Why Not a Ton-Mile Basis for Motor Vehicle Taxes?

To the Editor:

An enormous road building program has been existent for the past twenty years with billions of dollars spent in its fulfillment. Most of this money has been realized by public financing through bonds issued by the various municipalities, counties and states; in a great many instances the bonds are still outstanding with the original roads, which the funds thereof built, worn out and rebuilt. The subsequent development of commercial truck and bus transportation in direct competition with the railroads has proceeded without such transportation services paying the cost of the highways, the interest thereon or the maintenance, except inconsequential fees paid to the various state commissions organized for the regulation of intrastrate traffic and, within recent years, the gasoline taxes. Those of us who have watched this development have naturally wondered how long such a condition would be permitted to exist until the apparent inequality is remedied.

The private automobile, operated for pleasure or business of the owner, as well as trucks operated by either individuals or companies in connection with the distribution of their products, will probably be forever exempt from any direct taxation for the use of highways. But motor vehicles operated for revenue and engaged in either intrastate or interstate business, either in hauling freight or passengers, should certainly be made to bear their fair proportion of the construction, interest and maintenance costs of the highways.

The railroads have built at their own costs roadbeds and tracks, and pay taxes to the state and counties in which such property is located on the basis of the value of their property. Through their system of accounting they know what costs of maintaining such roadbed and tracks, together with what taxes thereon, are assignable to the hauling of one ton of freight one mile, from which the term per ton per mile has originated.

Why cannot the respective costs of the highways and their maintenance also be determined and reduced to a figure representing the cost of so much per ton per mile and this figure used in establishing a basis of taxation upon the commercial motor vehicle?

The various county and state highway commissions, working in co-operation with the Bureau of Public Roads, and the various utility and corporation commissions of the states, working in conjunction with the Interstate Commerce Commission, could arrive at figures that would enable the various legislatures to provide an equitable system of taxation on this basis.

Such a plan seems practical and while uniformity as between the states would be essential, initial steps could now be taken towards the eventual promulgation of a system of taxation on some such basis.

John Zalaha.

New Book

Bergbahnen (Mountain Railways), by O. Ammann and C. v. Gruenevaldt. 178 pages, illustrated, 9¼ in. by 6½ in. Bound in cloth. Published by Verlagsbuch-handlung Julius Springer, 23-24 Linkstrasse, Berlin W9, Germany.

This text is Volume 9 of Section 2 of a "Handbook Library for Construction Engineers" and comprises a mathematical and descriptive treatise on rack and cable-operated railways and aerial cableways. In addition to technical text matter relating to the design of tracks, racks, gears, cables, locomotives, etc., it contains a great deal of statistical data and descriptive matter on various actual installations. The book is profusely illustrated with excellent reproductions of both line drawings and photographs.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Automatic Train Control—Development and Progress, by Committee on Automatic Train Control, American Railway Association. Its Bulletin No. 1, describing early development, tests, types of devices, ICC orders, and present situation and including a bibliography listing material published since 1894 190 p. Pub. by Committee, Washington, D. C., 75 cents "for officials and employees of members of the American Railway Association." For others $1.50. Bibliography available as reprint: 25 cents to railroad men as above, 50 cents to others.

Eighth Annual Report of the Railway Rates Tribunal of Great Britain. Covers the 1929 work of this body in the execution of its functions under the Railways Act, 1921, the Railway (Road Transport) Acts, 1928 and the Local Government Act, 1929. 24 p. Pub. by His Majesty's Stationery Office, London, England. 25 cents.

Facts About British Railways. A compilation in popular form of interesting operating, traffic, financial and personnel statistics, including "many hitherto unpublished facts about British Railways." 28 p. Pub. by British Railway Companies' Association, London, England.

An Outline of the State Control of English Railway Rates and Facilities, by H. C. Sparke. A survey of the various acts of Parliament and their provisions. 105 p. Pub. by Chuckervertty, Chatterjee & Co., Ltd., Calcutta, India. 2 rupees, 8 annas.

Periodical Articles

Architecture Astray, by Chester Henry Jones. The author believes that "efficiency has been placed second to the interests of Classic design" in the design of railway stations. He discusses both English and American stations, p. 70-71. Atlantic Monthly, January, 1931, p. 64-74.

A $400 Elementary School Library, by Laura C. Bradley. Discusses general problems confronting such a library and lists under subjects books suitable for use of children in various grade. Books under "Transportation" (i. e., Land, Water, Railroads and Mail Service) on p. 247. Wilson Bulletin, December, 1930, p. 241-249.

How Will the Railroads Regain Their Lost Passengers? by Franklin Snow. A discussion of advertising problems. Advertising and Selling, January 7, 1931, p. 22-23, 69-70

The Railroad Crisis, by Carlton A. Shively. Discusses unusual aspects of present railroad conditions. Spur, January 1, 1931, p. 82, 83.

Railroads in French Indo-China, by Thomas Butts. "There are 2,389 kilometers (1,485 miles) of railroads open to public traffic in French Indo-China, which are divided into three groups comprising the Northern and Annam Railway, the Southern Railway, and the Compagnie Française des Chemins de Fer de l'Indochine et du Yunnan. . . ." p. 113. Commerce Reports, January 12, 1931, p. 113-114.

Transport Co-ordination: Meaning and Purpose, by G. Shorey Peterson. Discusses differentiation in function, developing joint services, co-ordination to reduce competition, co-ordination conceived as railway control, and in his summary and conclusions, defines co-ordination (p. 680). Journal of Political Economy, December 1930, p. 660-681.

William Albert McGonagle—A Memoir, by William E. Culkin. A memorial to the late president of the Duluth, Missabe & Northern, which necessarily contains much Minnesota railroad history. Accompanied by portrait. Read at meeting of executive council, Minnesota Historical Society. Minnesota History, December, 1930, p. 413-420.

Odds and Ends . . .

Busy Track

The stretch of track belonging to the Delaware & Hudson, north of Avoca, Pa., probably has more railroads operating trains over it than any other track in the country, excluding terminals. Besides the Delaware & Hudson, the Lehigh Valley uses it for 2 miles, the Central of New Jersey for 12 miles and the Erie for 22 miles.

Tiniest Train?

Possibly the world's tiniest train, and certainly the most costly for its size, has been built by J. Martin, a watchmaker, of Walthamstow, England. It is constructed entirely of gold and silver. The locomotive is 1⅜ in. long, the whole train is only 8 in. long, and it runs by clockwork on a track 4 ft. 6 in. long, requiring 2 hr. 30 min. to traverse the distance, or at a speed of about three miles a year.

Travelers—But All in One Place

Capt. George B. Kirwan, skipper of the Pennsylvania steamer *Maryland,* has made more than 36,000 "voyages" across Chesapeake Bay between Norfolk and Cape Charles, Va., in his 32 years of service with the railroad. Capt. Alfonso Sadler of the *Virginia Lee* has made 27,000 trips across the bay in his 40 years of service. Their combined water travel totals more than 2,268,000 miles. The ferries connect Norfolk with the Pennsylvania's rail line terminating at Cape Charles.

Drives With Broken Hip

Trainmen and others who met Canadian Pacific train No. 2 as it drew into Schreiber, Ont., recently, had no idea that the engineer at the throttle had driven his train for the last 70 miles, from Nipigon to Schreiber, with a broken hip; yet that actually was the case. Engineer Benjamin Daniels, when mounting the footplate at Nipigon after inspecting his engine, slipped and fell back upon the ground, a distance of 10 ft., fracturing his hip. As he was unable to rise without help, the fireman and others assisted Daniels to his seat at the right hand side of the cab, and he drove his train into Schreiber without losing a moment's time. When No. 2 arrived at Schreiber, a special train was in waiting, and the injured engineer was rushed back to Fort William. He is resting easily, though he will be in the hospital several weeks.

First Open-air Observation Car

CHICAGO, ILL.

TO THE EDITOR:

Perhaps it will be of interest to have a picture of the first open-air observation car to be placed in passenger service. During the construction of the Saratoga & Encampment railway in 1907, an excursion party was handled from Walcott, Wyo., to Saratoga. The S. & E., being scantily supplied with passenger equipment, had an open-air observation car constructed which proved to be quite successful.

One of the First Open-Air Observation Cars

C. W. BALDRIDGE,
Assistant Engineer,
Atchison, Topeka & Santa Fe.

Delights of Continental Travel

These new third-class fares on American railroads probably never will permit the insouciance and sang froid of third-class travel abroad. There one may learn the thrill of being jammed into a narrow compartment between a lady feeding her lap dog bologna and a gent who is "limburger-conscious," while across the way a congenial couple opens a lunch basket containing the surplus of the world's garlic crop.

Railway Ticket Becomes Antique

An unused portion of a railway ticket bought in the Chicago office of the Grand Trunk 55 years ago, found in the effects of a late resident of Andover, Mass., has been turned in to the Central Vermont passenger department for a refund. It was sold in Chicago on April 20, 1875, the routing reading Grand Trunk, Chicago to Montreal; Central Vermont Railway from Montreal to White River Junction; Northern New Hampshire Railroad, White River Junction to Concord, N. H.; Concord Railroad, Concord to Nashua; Boston, Lowell & Nashua Railroad, Nashua to Boston. As the Grand Trunk and Central Vermont portions of the ticket are marked, indicating that they have been honored for transportation, no refund will likely be allowed and the ticket will be submitted to the Boston & Maine for action on the unused portion between White River Junction and Boston.

Quoting the Bible on Transportation Matters

By F. H. Johnson

As to Passes:

Although these Scriptural admonitions against the "pass evil" first appeared in the press many years ago, they still are interesting:

Beware that thou pass not ..... 2 Kings 6:9
This generation shall not pass..... Mark 13:30
None shall pass ..... Isaiah 34:10
And suffered not a man to pass..... Judges 3:28
No man may pass ..... Ezek. 14:15
Though they roar, yet they cannot pass ..... Jer. 5:22
So he paid the fare thereof and went ..... Jonah 1:3

It may not be known generally that the Scriptures do not mince matters in discussing various transportation agencies that are now in the field of competition with railways. Here are a few choice references:

About Waterways . . . . note the prophetic warning:

He rebuketh the sea . . .and drieth up all the rivers . . . Nahum 1:4
I am against thee and thy rivers..... Ezek. 29:10
A nation—trodden down, whose land the rivers have spoiled ..... Isaiah 18:2

As to Highway Travel:

An amazing foreknowledge of modern highway conditions is shown by the following references. Note that Isaiah predicted the ultimate disappearance of the pedestrian:

The chariots shall rage in the streets; they shall jostle one against another in the broad ways; they shall seem like torches; they shall run like the lightnings.. Nahum 2:4
And your highways shall be desolate ..... Lev. 26:22
And Amasa wallowed in blood in the midst of the highway ..... 2 Sam. 20:12
And they gleaned of them in the highways five thousand men ..... Lev. 26:45
The highways lie waste, the wayfaring man ceaseth . . . . Isaiah 33:8

NEWS

Court Revokes Permit of Railway Competitor

Suggests that highway certificates be granted only where service inadequate

Suggesting that the Florida public utilities law be so construed that certificates to truck lines would be granted only where the public was not already adequately served by established carriers, whether rail or motor vehicles, the Supreme Court of that State in a recent decision revoked a permit which had been granted for the operation of a highway freight line paralleling the Seaboard Air Line between Tallahassee and Jacksonville.

The decision, according to reports from Tallahassee to the Associated Press, upheld the Seaboard Air Line and the Railway Express Agency, Inc., against H. T. Pace who had received the certificate from the Commission. The court discussed at length the question of motor truck lines operating on public highways paralleling the established railroad lines operating on privately owned tracks, saying: "We must not close our eyes to the fact that back of and underlying this immediate question is the ultimate and basic question whether 'public convenience and necessity' mentioned in the act could reasonably be construed to require or justify scrapping or serious crippling of railroads of the state where they are already rendering adequate service . . . to meet the needs of the territory."

The court advanced the prediction that if the railroad commission does not look into the question of whether the railroads are serving adequately when motor truck lines apply for permits, the time will come when all passengers and freight, except "heavy, bulky, low grade, basic commodities" will pass from the railroads, which own property and pay taxes, to motor lines which operate over highways built and maintained by the public for public use.

The result of the commission's policy in the case, the opinion said, "would be to bankrupt, or seriously cripple, rail lines, thus throwing thousands of railroad employes out of work, impair efficiency of railroad service or cause a tremendous increase in freight rates" while rapidly wearing out public highways, impeding ordinary use of roads and increasing the dangers to life and limb.

The railroads over a long period of years have been gradually fitted to a legislative harness which holds them in leash to their customers while extracting from them the last farthing of contribution to the public treasury. At present little or nothing of the kind is being imposed on the newer agencies. The result is a virtual subsidy to the latter which is crippling the railroads without economic excuse. Such favoritism can only end in social disaster.

Professor Ripley, of Harvard has echoed the demand of the Association of Railway Executives that Congress face the emergency by subjecting all common carriers to the same species of regulation which now handicaps the railroad. This, it seems to us, is the least it can do to remedy a dangerous situation.

—New York Herald Tribune

Container Case Argued Before I.C.C.

Oral arguments were heard by the Interstate Commerce Commission on January 14 and 15 on the proposed report submitted by Attorney Examiner H. C. Ames in August, 1929, following an investigation of container service, in which he recommended that the commission find the container service desirable in the public interest when applied to eastern territory but not to western territory, but that the present and proposed rates for the service are unlawful. Examiner Ames recommended a basis of third-class rates, subject to the carload rate on any commodity in the container as a minimum.

Extension of the container service was advocated by Clyde Brown, general solicitor of the New York Central, H. W. Bikle, general attorney of the Pennsylvania, and H. H. Larrimore, general attorney of the Missouri Pacific, as the only practical solution that has been offered for the two problems of the economical handling of l. c. l. freight and the meeting of motor truck competition. They objected, however, to the inflexible basis of rates proposed by Mr. Ames, the New York Central and Missouri Pacific favoring a sliding scale decreasing with the net weight of the shipments in a container while Mr. Bikle advocated third-class rates as a basis but urged the commission not to prescribe it by order. He said that the roads should be allowed some

(Continued on page 213)

Lower Fares Opposed by Southwestern Lines

Three roads protest Frisco tariffs proposing system-wide two-cent rate

The long-standing difference of opinion among railway officers as to whether the roads should attempt to regain the passenger traffic lost to buses and private automobiles by reducing their coach fares seems about to come to a show-down before the Interstate Commerce Commission. A vigorous protest has been filed by the Missouri Pacific, the Missouri-Kansas-Texas and the St. Louis Southwestern asking the commission to suspend tariffs filed by the St. Louis-San Francisco proposing to establish coach fares of approximately 2 cents a mile between all points on its system, effective on February 1.

Many western roads have recently been allowed by the commission to establish experimentally reduced coach fares on short notice covering a large part of western territory, but the Frisco went a step further by making the proposed reduction general. The protesting lines assert that the 2-cent rates are not only unreasonably low and less than minimum reasonable rates but would of necessity require similar reductions on the lines of the protestants and eventually cause a similar reduction in passenger fares throughout the Southwest and in interline traffic. On the assumption that 50 per cent of the passenger revenue represents coach travel the protestants say that it would be necessary to increase coach travel 80 per cent to secure the same gross revenue, and it is their opinion that it is not possible to increase the local coach travel that much. They also fear that the lower rate would attract passengers from Pullman sleepers to coaches.

The three protesting southwestern lines say that while on a two-cent fare some proportion of the bus passengers might be induced to use the railroads, the volume thereof, in the opinion of the protestants would be negligible because the traveling public use buses primarily because of frequency of service and because they can take them at hotels and can be discharged at their destinations at convenient points So far as the competition of private automobiles is concerned they say "it is a matter of common knowledge that owners of private automobiles can under present rates travel

more economically by railroad at 3.6 cents a mile than with the use of their private automobiles, which, it is safe to say, cost from 6 to 8 cents a mile to operate."

The Baltimore & Ohio has applied to the commission for sixth section permission to establish on short notice joint through fares from Washington to western points to which reduced coach and tourist sleeping-car fares have recently been established by western roads, on the basis of the regular fares over the B. & O. lines and the reduced fares beyond. This is to meet the competition of southeastern lines that have joined in the through rates.

Perry Heads Eastern Passenger Agents Association

F. R. Perry, general agent of the passenger department, Canadian Pacific, at New York City, has been elected president of the General Eastern Passenger Agents' Association of New York.

Grade Crossing Accidents Reduced

A marked reduction in the number of accidents at highway grade crossings is shown by reports for the first nine months of 1930 filed by the railroads with the Interstate Commerce Commission, showing a total of 3,380 for the period. Fatalities totaled 1,448, a reduction of 263, while persons injured totaled 3,831, a reduction of 853.

Canadian Pacific Absorption of Kettle Valley

The Kettle Valley Railway ceased to exist as a separate operating entity on January 1 and the line between Hope, B. C., on the main line of the Canadian Pacific, and Midway, B. C., where it connects with the Nelson division of the C. P. R., has become the Kettle Valley division of the parent road.

Canadian Commissioner Retires

Col. Thomas Vien, deputy chief commissioner of the Board of Railway Commissioners for Canada has retired from that body and resumed the practice of law. Col. Vien's retirement will not take effect until May 1, 1931, so that, in the interval, he may complete unfinished business connected with his duties as a member of the board.

Correction

An item entitled "Hawaiian Boat Trains," which appeared in the *Railway Age* of December 27, stated that "By means of this service, the time required to travel from New York to Hawaii is reduced to 6 days." This is incorrect, since the time is approximately 7½ days. Cars will leave New York at 11:50 p.m. on January 20 and the boats with which the trains connect will arrive in Honolulu at 2 p. m. on January 28.

Transportation Club of Seattle

The Transportation Club of Seattle (Wash.) has elected the following officers: President, Herbert Schroeder, traffic manager of the Washington Co-operative Egg and Poultry Association; vice-president, W. S. Elliott, general agent of the Union Pacific, and secretary-treasurer, C. H. Carlander, general manager of the Puget Sound Freight Lines.

California Commission Personnel

M. B. Harris of Fresno, Cal., has been appointed a member of the Railroad Commission of California for a term expiring in December, 1936, succeeding Thomas S. Louttit. Fred G. Stevenot, California state director of natural resources for the past four years, has been appointed a member of the commission for two years to fill the unexpired term of William J. Carr, who has been selected for a term of six years to succeed Ezra W. Decoto.

Club Meetings

The Transportation Club of St. Paul will hold its ninth annual dinner on January 22. Hal S. Ray, director of personnel and public relations of the Chicago, Rock Island & Pacific and John T. Sullivan of Mandan, N. D., will be the speakers.

The Traffic Club of Kansas City held its tenth annual dinner on January 12, the speaker of the evening being Samuel O. Dunn, editor of the *Railway Age*, whose subject was "The Transportation Situation."

Safety Records

The Minneapolis & St. Louis reports that its last employee fatality occurred on June 18, 1928, thus establishing a record of over 2½ yr. without a fatal injury to an employee in service. The total man hours worked from June 18, 1928 to December 20, 1930 is approximately 27,779,533.

The fifth district of the Kansas City Southern, extending from De Queen, Ark., to Shreveport, La., has not had a reportable injury to a train or engineman for more than three years.

Frisco's Oil Wells

A forty-thousand-barrel oil well which came in on December 3; the drilling of a second well is near completion, and plans to drill three more, mark the development of the oil industry on the St. Louis-San Francisco's premises at Oklahoma City, Okla. After several productive wells were drilled in the Oklahoma City fields, oil companies began negotiations for drilling rights on the Frisco property early in the spring of 1930 and a lease was entered into with the T. B. Slick organization, on May 28, whereby that organization is permitted to drill on the railroad's ground.

Crow's Nest Rates for Hudson Bay Grain

Premier R. B. Bennett of Canada announced at a speech in Regina a few days ago, when he was outlining various plans for relieving the present economic distress in the Dominion, that a concession would be made to Western grain producers in the matter of grain rates. He stated that when the Hudson Bay Railway was ready for operation the charges for hauling of grain from the prairies to Fort Churchill would be on the basis of the Crow's Nest Pass Agreement rates.

Pennsylvania Women's Aid

The Pennsylvania Railroad Women's Aid distributed approximately 4,250 Christmas baskets to the sick and unfortunate among the families of the Pennsylvania employees. This relief organization is composed of wives, mothers and daughters of Pennsylvania employees and is the outgrowth of the Women's Division for War Relief organized during the World War to assist families of Pennsylvania employees who were called into military service. Mrs. W. W. Atterbury is director of the organization which includes more than 200,000 members.

Canadian Customs Inspector at Chicago

In order to eliminate the inconvenience and delay of inspection at the Canadian border, a Canadian customs inspector is now located at Chicago to inspect the baggage of passengers and merchandise moving over the Michigan Central and Canadian Pacific from that city to points in Canada. With this arrangement, passengers can travel from Chicago to points in Canada without having their baggage inspected at the border, while merchandise shipped to Canada is not delayed at the border for inspection.

Missouri Pacific Employees Form Relief Committees

Employees of the Missouri Pacific have organized a relief committee to aid former employees and their families who may be in destitute circumstances due to temporary unemployment. The work of the committee will be supported entirely by contributions from the employees, who are voluntarily contributing a percentage of their monthly salaries for the next several months to provide funds to meet the situation. In addition to these contributions of cash, arrangements will be made for the collection of clothing, food, etc.

Proposed Changes in Ohio Tax System

The repeal of the gross receipts tax on railroads and the taxation of such utilities on the same basis as business corporations is recommended by the sub-committee on railroads of the taxation committee appointed by Governor Cooper, of Ohio. The report calls attention to the strenuous competition railroads must meet from motor coaches, trucks, pipe lines, electric power transmission lines and airplanes.

"The country cannot do without railroads, notwithstanding all these new agencies," the report continues. "They now pay a property tax on valuations higher than valuations placed on other property, those valuations being fixed by the Ohio Tax Commission. The net tax value of a railroad in Ohio includes not only its tangible property, but all elements of good will, elements not reached in the taxation of other industries.

"In addition to the property tax, the railroads are required in Ohio to pay an excise tax of 4 per cent upon their gross intrastate earnings."

Smoking in Boston & Maine Dining Cars

The Boston & Maine will henceforth permit smoking in its dining cars, a vote of patrons of these cars, which has been taken during the past month, having shown that 78 per cent of the voters favor the practice of smoking in dining cars; 22 per cent voting the other way. Of the women voters, 26 per cent voted against smoking, while of the men 20 per cent took that side. The notice allowing smoking says that "when there are passengers waiting to be served and you have finished, your use of the smoking accommodations provided in other cars, will be appreciated."

South Dakota Governor Suggests Abolition of Railroad Board

Abolition of the South Dakota Board of Railroad Commissioners as having "outlived its usefulness" was recommended by Gov. William J. Bulow of that state, United States Senator-elect, in his final message to the state legislature on January 6. Governor Bulow stated that the citizens of South Dakota would obtain little benefit from the fixing of rates applicable to transportation agencies other than railroads according to a railroad rate basis. He suggested that if the legislature desired to maintain supervision over transportation rates it could be handled by a rate expert attached to the office of the attorney general.

Sub-Committee to Study Bus Bill

The Senate committee on interstate commerce on January 13 appointed a subcommittee to make a further study of the bill for the regulation of motor bus transportation, which was re-committed to it by the Senate. The committee held a meeting on January 8 to consider a number of amendments suggested by Commissioner Eastman as chairman of the legislative committee of the Interstate Commerce Commission, but took no action; and at a further meeting on January 12 decided to appoint the subcommittee, consisting of Senators Hastings, Kean, Brookhart, Dill, and Barkley. It is understood that no directions were given the sub-committee on the question of including the regulation of trucks in the provisions of the bill.

Trans-Missouri-Kansas Shippers' Board

Reports submitted by representatives of industry from within the states of Missouri, Kansas, Oklahoma, Arkansas, and Illinois to the Trans-Missouri-Kansas Shippers' Board on prospects for the first quarter of 1931 indicate that carloadings will aggregate approximately 4.4 per cent less than the shipments made during the same period of 1930. Products of agriculture will show a decrease of 4.3 per cent. The lumber industry is expecting an increase of approximately 10 per cent. The automotive industry, including all assembly plants at Kansas City and St. Louis, anticipates a reduction of 45.4 per cent in shipments and the agricultural implements and machinery industries one of 22 per cent under 1930.

Life Passes for B. & M. Employees

The Boston & Maine has issued to 288 active and pensioned employees annual passes, each good for the life of the recipient; the passes being lettered in gold in recognition of the fact that each of these employees began his service more than 50 years ago. Seventeen of these veterans, each individual representing a certain class of employees, were invited to headquarters and the presentation to them, by President Edward S. French, was made a brief ceremony. Of the 288 veterans thus recognized, 96 are still in active service. C. J. Fiske, ticket agent at Greenfield, Mass., received pass No. 1, he having been in the service 61 years and three months. Warren E. Emerson, a locomotive engineman on a switcher, has served 60 years, 8 months, and George A. Silsbee, conductor, 59 years, 5 months.

Rate Reduction to Meet Truck Competition Suspended

A plan of the Atlantic Coast Line and the Norfolk Southern to meet motor truck competition for shipments of tobacco by putting into effect an experimental reduction in freight rates was temporarily halted on January 9 by the Interstate Commerce Commission, which suspended, pending an investigation, the tariffs filed by the roads. They proposed to reduce from 36 to 25 cents per 100 lb. the rates from points in North Carolina to Norfolk, Portsmouth, Pinners Point, Richmond, South Richmond and Petersburg, Va., with a provision by which the reduced rates would expire June 29. On protests filed by the Chesapeake & Ohio and the city of Newport News, the tariffs were suspended until August 10.

Mid-West Shippers' Board

Reports of standing committees forecasting freight car loadings during the first quarter of 1931 and submitted at the seventh annual meeting of the Mid-West Shippers' Advisory Board at Chicago on January 8, indicate that business in that territory will be 6.2 per cent less than in the first quarter of 1930. The meeting, which was attended by over 500 representatives of railroads and industries, was preceded by a luncheon. During the evening those attending the meeting were guests at a non-resident members' "home-coming" given by the Traffic Club of Chicago.

The officers of the board were re-elected for the ensuing year. These include general chairman, George A. Blair, general traffic manager of Wilson & Co., Chicago; alternate general chairman, Lawrence Farlow, secretary of the Farmers' Grain Dealers' Association of Bloomington, Illinois, and J. E. Bryan, traffic manager of the Wisconsin Paper & Pulp Manufacturers' Traffic Association, Chicago.

Among the expected decreases, shipments of machinery and boilers are expected to be 21 per cent less than in the first quarter of 1930; agricultural implements and vehicles other than automobiles 21 per cent, ore and concentrates 14 per cent, lumber and forest products 14 per cent, and automobiles, trucks and parts 13 per cent. Increases expected are in shipments of citrus fruits, 40 per cent; other fresh fruits, 10 per cent, and other fresh vegetables, 2 per cent.

Ohio Commission Overruled in Express Agency Case

The Ohio Supreme Court, in a recent opinion, reversed a decision of the public utilities commission of that state refusing a certificate of convenience and necessity to the Railway Express Agency, Inc., for the operation of a motor truck route between Delroy and Canton. The decision of the Commission in this case was reported in the *Railway Age*, Motor Transport Section of April 26, 1930, page 1038.

The route involved parallels a section of the Wheeling & Lake Erie where train service has been discontinued. Following the discontinuance, the Express Agency sought to continue by motor truck the service which it had formerly carried on in connection with the trains. The commission held that the Express Agency was not entitled to a certificate for service over the route which was served by other trucking companies under previously-issued certificates.

Federal Expenditures for Highways and Waterways

President Hoover announced, shortly before the close of the year, an estimate of expenditures to be made by the federal government during the calendar year 1931 for public contruction amounting to $724,058,000, including $219,922 for federal-aid highways and $159,857,000 for rivers and harbors. These figures will include the regular amounts authorized for such purposes and additional amounts authorized to reduce unemployment by accelerating public works. The total compares with a rate of about $275,000,000 per annum prior to the depression. The Bureau of Public Roads has notified the states that $80,000,000 for highway improvement authorized by Congress, is available for immediate use by states in place of state funds to match regular federal-aid funds previously authorized and apportioned. Secretary of War Hurley has approved allotments of $20,813,340 from the appropriation recently made by Congress to relieve unemployment by expediting work on waterways and has approved the plans and procedure submitted to him by the chief of engineers for the prosecution of work on the Illinois waterway.

Ship by Rail!

The Handlan-Buck Manufacturing Company, St. Louis, Mo., attaches colored notices to orders, calling attention to the need of shipping by rail. The notice reads: "We are able to send you this order because the railroads have sent us one. The railroads were able to buy this material from revenue received for the transportation of freight. If this

arrangement is to be continued, your shipments should move by rail, likewise the shipments of your customers and all merchants and manufacturers whom you patronize. . . ."

Another slip, which is attached to bills paid is as follows: "We are able to pay this money to you because the railroads have paid it to us. It was paid to the railroads for the transportation of freight. . . ."

Examiner Recommends Against Proposed Iron and Steel Rates

A recommendation that the Interstate Commerce Commission find not justified an upward revision of rates on iron and steel articles from Birmingham, Ala., and other southern points to trunk line, New England and Buffalo-Pittsburgh territory is made by Examiner W. M. Cheseldine in a proposed report. The roads proposed to cancel commodity rates and to substitute eighth-class rates. The report suggests rates on the mileage scale basis prescribed by the commission in Part 6 of its rate structure investigation. The rates prescribed in that case for official territory approximated 30 per cent of the first class rates subsequently prescribed for that territory and by the suspended schedules the roads had attempted to place rates on the same percentage basis of the first class rates from the South to those points.

Second Judge in Oregon Line Construction Suit Dies

A second rehearing of the petition of the Oregon-Washington Railroad & Navigation Company to enjoin the Interstate Commerce Commission from enforcing its order directing that railroad to build a line between Crane, Oregon, and Crescent, 185 miles, is expected in the federal court at Portland, following the death of Federal District Judge Robert S. Bean from a heart attack at Portland on January 7. Judge Bean, with Federal District Judge John H. McNary and Circuit Judge Frank S. Dietrich, constituted a three-judge federal court which presided at the original hearing of this petition at Portland on September 29 and 30, 1930. Judge Dietrich died on October 2, necessitating a rehearing of the case on December 9 with Circuit Judge Frank H. Rudkin taking his place. The Interstate Commerce Commission has twice postponed the effective date of its order to allow completion of the court proceedings.

N. Y. Shippers to Study Railway Proposals

The Shippers' Conference of Greater New York, at a meeting held on January 15, appointed a committee to study the program adopted by the Association of Railway Executives at its meeting in New York on November 20. This program, which is designed to cope with the unfavorable state of railway earnings and traffic, was reported in the *Railway Age* of November 22, page 1087.

It is the plan of the Shippers' Conference to have its committee make a report on these railway proposals as well as upon recent developments in connection with consolidation plans of eastern trunk lines. The Conference at the same time reiterated its opposition to the placing of coastwise shipping rates under the jurisdiction of the Interstate Commerce Commission. Extension of the commission's jurisdiction in this manner was one of the railway executives' proposals.

Strathcona Fellowships

Five Strathcona Memorial Fellowships in Transportation are now open at Yale University, application for which should be addressed to the Dean of the Graduate School, Yale University, New Haven, Conn., before March 1. These fellowships, worth $1,200 each, offered annually, contemplate studies in the construction, equipment and operation of railroads, and other engineering problems connected with the efficient transportation of passengers and freight, as well as the financial and legislative questions involved. Transportation by water, highway, or airways, and the appropriate apparatus involved, and also other general aspects of the broad field of transportation, embracing its legal and economic phases, will be included in the lists of subjects which the Fellows may select for investigation and study. In accordance with the will of Lord Strathcona, preference is shown to persons who, for at least two years, have been connected with the railroads of the northwest or to the sons of such persons.

C. P. R. Trainmen Spread Employment

Unemployment relief measures providing work for more than 500 train and yard men on the Canadian Pacific Eastern Lines were effected last week when an agreement was reached between officers of the railway and the general committee of the Brotherhood of Railroad Trainmen, whereby the working time of some 3,100 train and yardmen will be cut down to make room for additional employees. The agreement was reached after a two-day conference in Montreal between George Hodge, assistant general manager of the C. P. R. and 19 members of the Brotherhood committee, representing 3,100 employees of the Canadian Pacific on lines east of Fort William.

As a result of the consultation the working time of yardmen on the C. P. R. eastern lines will be cut down to a maximum of 26 days per month and the milage of baggagemen and trainmen in proportion. It is estimated that this action will provide work for approximately 500 more men.

A Tenth Anniversary

With the end of 1930, the Pennsylvania's employee-representation plan, by which all labor questions are settled between the management of the road and representatives elected by the employees, has been in existence 10 years. It was on December 29, 1920, that representatives of the train and engine service met in Philadelphia and agreed with the company on the new plan. Gradually the plan has been extended to cover the other employees.

Officers of the road and chairmen of employee committees today agree in the statement that the plan has worked to the entire satisfaction of both parties. Every one of the 1,534 cases of major importance which have been considered, affecting the welfare of employees in the train and engine service of the railroad, have been amicably adjusted. Only one case required the services of an outside arbiter. Hundreds of cases among all classes of employees, brought before local committees, have been settled before reaching the joint reviewing committee which functions for the whole system.

Rock Island Consolidates Divisions

The Chicago, Rock Island & Pacific, on January 1, consolidated its Dakota division with the Iowa and Cedar Rapids-Minnesota divisions. The portion of the Dakota division between Short Line Junction (Des Moines), Iowa, and Minneapolis, Minn., has been absorbed by the present Iowa division and the name of the latter has been changed to the Iowa-Minnesota division. The headquarters of the Iowa-Minnesota division will remain at Des Moines. The remainder of the Dakota division, which had its headquarters at Estherville, Iowa, has been absorbed by the present Cedar Rapids-Minnesota division, and the name of that division has been changed to Cedar Rapids-Dakota division. The headquarters of the Cedar Rapids-Dakota division will remain at Cedar Rapids, Iowa.

On the same date the jurisdiction of the operating officers of the Rock Island, including general, district and Illinois division officers was extended over the Peoria Terminal. The Peoria Terminal has begun the operation under lease of the Peoria, Hanna City & Western, extending from Hollis Junction, Ill., to Mine No. 6, about 5 miles.

Industrial Traffic Management is Studied in Government Survey

That effective traffic management in commercial and industrial concerns now is a major phase of general business activity and a factor of fundamental importance in the elimination of distribution wastes in American industry is indicated by the report of a special study of the methods and problems of industrial traffic management just made public by the Department of Commerce. The survey was undertaken in co-operation with national and local traffic organizations, with the object of revealing sources of waste. Numerous instances where concerns discovered methods of stopping large wastes in their distribution systems are cited in the report.

The report shows a cross section of the traffic, transportation and shipping arrangements of the nation's business enterprises. Transportation expenses are among the least understood of the major cost elements in business, the report holds. In medium-sized businesses they were

found to average 25 per cent of the total expenses of operating the enterprises; in many instances much higher than this. Even in very large industries at least 10 per cent of their total costs were revealed to represent traffic charges. The physical distribution phases of business are too often neglected.

Some of the more important sources of waste are shown to be failure to get proper rates on commodities shipped; failure to combine less-than-carload shipments into carloads; carelessness in checking freight and express bills; neglect to make out and properly support claims against carriers; and failure to see that commodities shipped are properly packed to carry safely to destination.

Well-managed traffic departments usually show a profit from their operations. That is, actual cash receipts from overcharge and damage claims collected from carriers, freight allowances, insurance settlements and the like generally exceed the cost of maintenance of the department itself. The traffic department can insure the smooth inflow of necessary raw materials and the expediting of services to customers. Ways are pointed out in which

(*Continued on page 212*)

Operating Revenues and Operating Expenses of Class I Steam Railways in the United States

Compiled from the Monthly Reports of Revenues and Expenses for 171 Steam Railways, Including 16 Switching and Terminal Companies.

FOR THE MONTH OF NOVEMBER, 1930 AND 1929

Item	United States		Eastern District		Southern District		Western District	
	1930	1929	1930	1929	1930	1929	1930	1929
Average number of miles operated	242,761.61	242,817.73	60,296.52	60,188.27	46,098.76	46,138.41	136,366.33	136,491.05
Revenues:								
Freight	$311,041,504	$384,507,006	$129,163,281	$161,972,097	$57,889,537	$69,653,768	$123,988,686	$152,881,141
Passenger	[a] 48,709,635	[b] 62,477,729	27,975,088	34,053,876	5,846,885	8,238,365	14,887,662	20,185,488
Mail	8,995,467	[c] 12,674,704	3,446,528	6,209,473	1,499,903	1,750,174	4,049,036	4,715,057
Express	8,290,476	12,492,529	3,752,652	5,355,746	1,286,538	1,843,044	3,251,286	5,293,739
All other transportation	12,020,358	15,452,175	7,176,238	9,280,937	1,049,119	1,333,599	4,372,212	5,480,434
Incidental	8,877,686	11,263,652	4,616,004	5,455,433	998,547	1,396,184	2,685,924	3,769,240
Joint facility—Cr.	1,103,391	1,228,826	374,804	373,126	193,333	199,524	535,254	656,176
Joint facility—Dr.	252,081	318,364	81,456	84,712	28,867	36,160	141,758	197,492
Railway operating revenues	398,786,436	499,778,257	176,423,139	222,615,976	68,734,995	84,378,498	153,628,302	192,783,783
Expenses:								
Maintenance of way and structures	49,220,243	68,069,473	22,215,681	29,178,783	8,753,821	12,043,624	18,250,741	26,847,066
Maintenance of equipment	75,403,324	99,543,514	35,216,434	47,305,004	13,230,705	18,101,863	26,956,185	34,136,647
Traffic	10,048,453	10,830,971	3,880,207	4,289,496	1,878,214	2,004,713	4,290,032	4,536,762
Transportation	146,413,202	174,672,265	68,747,078	82,870,135	23,428,779	27,025,643	54,237,345	64,776,487
Miscellaneous operations	3,819,195	4,518,792	1,852,797	2,164,418	384,825	469,917	1,581,573	1,884,457
General	15,383,312	16,576,433	6,697,701	7,205,780	2,611,685	2,765,439	6,073,926	6,605,214
Transportation for investment—Cr.	986,475	1,443,144	157,773	423,138	95,140	146,082	733,562	873,924
Railway operating expenses	299,301,254	372,768,304	138,452,125	172,590,478	50,192,889	62,265,117	110,656,240	137,912,709
Net revenue from railway operations	99,485,182	127,009,953	37,971,014	50,025,498	18,542,106	22,113,381	42,972,062	54,871,074
Railway tax accruals	25,900,546	29,918,678	10,072,366	12,036,965	5,049,317	5,482,079	10,778,863	12,399,634
Uncollectible ry. revenues	58,020	108,958	19,922	55,207	8,131	18,977	29,967	34,774
Railway operating income	73,526,616	96,982,317	27,878,726	37,933,326	13,484,658	16,612,325	32,163,232	42,436,666
Equipment rents—Dr. balance	9,072,875	8,181,448	4,696,826	3,992,067	162,072	[d] 294,739	4,213,977	4,484,120
Joint facility rent—Dr. balance	2,384,636	2,160,238	1,238,097	1,059,256	265,267	219,488	881,272	881,494
Net railway operating income	62,069,105	86,640,631	21,943,803	32,882,003	13,057,319	16,687,576	27,067,983	37,071,052
Ratio of expenses to revenues (per cent)	75.05	74.59	78.48	77.53	73.02	73.79	72.03	71.54

FOR ELEVEN MONTHS ENDED WITH NOVEMBER, 1930 AND 1929

Average number of miles operated	242,759.27	242,672.64	60,308.59	60,167.66	46,129.67	46,137.82	136,321.01	136,367.16
Revenues:								
Freight	$3,804,892,256	$4,491,102,052	$1,612,565,667	$1,935,747,862	$693,968,221	$803,559,501	$1,498,358,368	$1,751,794,689
Passenger	[e] 674,193,253	[f] 799,558,010	373,331,522	427,429,002	86,820,138	108,688,238	214,041,593	263,440,770
Mail	100,144,397	[g] 135,766,146	38,303,124	55,305,988	16,751,621	21,013,751	45,089,652	59,446,407
Express	105,541,961	136,197,218	47,547,702	63,092,126	15,381,678	20,550,930	42,612,581	52,554,162
All other transportation	155,962,612	187,373,086	94,445,711	112,325,929	12,058,039	14,582,278	56,394,173	67,888,433
Incidental	115,406,152	131,930,990	56,365,815	62,424,351	14,048,615	15,510,174	38,056,411	46,572,911
Joint facility—Cr.	12,248,914	12,543,276	4,141,920	4,087,021	2,171,256	2,029,008	5,935,738	6,427,247
Joint facility—Dr.	3,365,310	3,558,407	1,014,314	898,921	367,761	391,468	1,983,235	2,268,018
Railway operating revenues	4,965,024,235	5,890,912,371	2,225,687,147	2,659,513,358	840,831,807	985,542,412	1,898,505,281	2,245,856,601
Expenses:								
Maintenance of way and structures	669,255,694	804,414,190	284,275,247	335,667,317	116,606,567	141,060,720	268,373,880	327,686,153
Maintenance of equipment	945,906,094	1,113,963,848	438,927,438	527,711,227	168,928,347	198,168,070	338,050,309	388,084,551
Traffic	118,216,282	119,399,727	45,320,403	45,582,100	21,868,390	21,858,029	51,027,489	51,959,598
Transportation	1,730,562,231	1,939,168,363	813,447,632	914,911,086	276,600,325	306,488,585	640,514,274	717,768,692
Miscellaneous operations	48,648,658	54,070,271	22,853,727	24,868,805	5,598,271	5,900,479	20,196,660	23,300,987
General	177,396,833	179,023,946	77,623,657	77,604,797	30,065,134	30,555,372	69,708,042	70,863,777
Transportation for investment—Cr.	11,810,158	12,865,410	2,320,724	3,203,446	1,048,767	1,080,888	8,440,667	8,581,076
Railway operating expenses	3,678,175,634	4,197,174,935	1,680,127,380	1,923,141,886	618,618,267	702,950,367	1,379,429,987	1,571,082,682
Net revenue from railway operations	1,286,848,601	1,693,737,436	545,559,767	736,371,472	222,213,540	282,592,045	519,075,294	674,773,919
Railway tax accruals	334,391,444	378,619,699	138,324,168	158,098,491	62,032,772	69,032,923	134,034,504	151,488,285
Uncollectible ry. revenues	853,867	1,066,006	335,238	442,284	147,228	238,126	371,401	385,596
Railway operating income	951,603,290	1,314,051,731	406,900,361	577,830,697	160,033,540	213,320,996	384,669,389	522,900,038
Equipment rents—Dr. balance	91,681,700	88,082,527	45,784,158	44,205,925	639,937	[d] 2,429,287	45,257,605	46,305,889
Joint facility rent—Dr. balance	25,411,559	23,261,885	13,372,812	11,753,416	2,589,193	2,163,291	9,449,554	9,345,178
Net railway operating income	834,510,031	1,202,707,318	347,743,391	521,871,356	156,804,410	213,586,992	329,962,230	467,248,971
Ratio of expenses to revenues (per cent)	74.08	71.25	75.49	72.31	73.57	71.33	72.66	69.95

[a] Includes $2,151,336 sleeping and parlor car surcharge. [b] Includes $2,833,822 sleeping and parlor car surcharge. [c] Includes approximately $2,988,449 back mail pay. [d] Deficit or other reverse items. [e] Includes $32,730,056 sleeping and parlor car surcharge. [f] Includes $37,144,131 sleeping and parlor car surcharge. [g] Includes approximately $33,562,568 back mail pay.

Compiled by the bureau of statistics, Interstate Commerce Commission. Subject to Revision.

Operating Statistics of Large Steam Railways—Selected Items for November, 1930, Com

Region, road and year	Average miles of road operated	Train-miles	Locomotive-miles: Principal and helper	Locomotive-miles: Light	Car-miles: Loaded (thousands)	Car-miles: Per cent loaded	Ton-miles (thousands): Gross, Excluding locomotives and tenders	Ton-miles (thousands): Net, Revenue and non-revenue	Average number of locomotives on line: Serviceable	Unserviceable	Per cent unserviceable	Stored
New England Region:												
Boston & Albany	1930 407	140,344	148,794	14,230	3,912	64.7	207,121	72,102	86	44	33.6	34
	1929 407	204,348	216,611	21,642	4,837	65.1	257,260	92,734	99	24	19.6	28
Boston & Maine	1930 2,066	338,420	384,585	39,832	11,226	65.7	621,958	232,940	257	40	13.5	71
	1929 2,059	403,089	472,248	57,231	13,136	66.2	708,831	266,983	243	54	18.2	29
N. Y., New H. & Hart.	1930 2,094	405,396	473,546	28,332	13,425	62.9	771,245	295,601	271	81	23.1	41
	1929 2,106	491,470	567,579	36,880	16,236	64.5	895,057	351,169	290	49	14.5	24
Great Lakes Region:												
Delaware & Hudson	1930 875	288,485	383,052	42,308	9,179	59.2	592,834	270,437	236	34	12.7	93
	1929 875	328,269	440,995	51,073	10,317	60.5	655,180	305,069	240	32	11.9	81
Del., Lack. & Western	1930 998	407,690	450,583	50,898	13,445	65.0	776,994	308,670	226	58	20.5	32
	1929 998	488,251	539,027	62,982	16,819	65.2	969,458	397,347	233	54	18.8	27
Erie (inc. Chi. & Erie)	1930 2,316	777,714	813,354	70,473	33,367	60.1	2,076,279	796,035	382	97	20.2	99
	1929 2,316	912,329	968,421	68,024	37,521	58.7	2,353,825	912,833	409	98	19.3	59
Grand Trunk Western	1930 1,020	223,184	226,442	3,979	6,006	62.1	350,202	127,151	76	38	33.0	38
	1929 992	265,459	268,512	3,377	7,448	60.0	439,027	157,622	95	33	25.6	20
Lehigh Valley	1930 1,343	447,768	480,064	46,958	13,863	62.1	852,045	349,547	246	103	29.5	27
	1929 1,343	511,086	558,662	62,896	15,867	61.7	962,231	395,264	278	73	20.9	33
Michigan Central	1930 1,865	405,584	406,646	13,009	13,168	59.6	779,647	266,897	157	60	27.5	44
	1929 1,822	500,441	501,632	14,836	15,985	57.9	985,808	342,357	193	43	18.2	40
New York Central	1930 6,468	1,756,103	1,903,483	125,469	64,021	59.1	4,058,935	1,640,370	966	383	28.4	311
	1929 6,467	2,157,461	2,359,174	198,794	75,936	58.0	4,874,059	2,008,999	993	300	23.2	164
New York, Chi. & St. L.	1930 1,660	545,627	552,478	7,459	16,643	59.0	992,625	349,200	199	63	24.0	41
	1929 1,665	651,917	658,197	6,606	19,640	59.4	1,159,237	418,901	206	46	18.2	20
Pere Marquette	1930 2,201	343,811	347,926	2,826	8,144	57.5	521,599	200,296	166	20	10.8	36
	1929 2,178	455,608	459,100	4,303	10,666	58.1	668,467	265,381	177	24	12.1	11
Pitts. & Lake Erie	1930 231	93,585	96,410	1,204	3,326	56.6	271,634	148,008	59	12	17.3	28
	1929 231	135,086	139,511	2,949	4,526	56.4	374,778	202,963	49	12	18.9	7
Wabash	1930 2,497	671,027	697,056	8,945	19,238	60.7	1,153,138	400,279	309	94	23.2	44
	1929 2,497	786,313	828,404	14,341	21,951	60.3	1,305,282	469,697	286	72	20.0	18
Central Eastern Region:												
Baltimore & Ohio	1930 5,541	1,525,421	1,761,043	205,376	45,589	57.8	3,160,706	1,375,553	883	291	24.8	172
	1929 5,536	1,927,448	2,198,612	269,390	56,155	58.0	3,913,148	1,771,530	1,049	184	14.9	163
Big Four Lines	1930 2,712	663,242	692,308	24,303	20,232	58.7	1,357,464	616,970	292	155	34.6	38
	1929 2,717	819,476	854,667	23,149	23,909	58.1	1,620,777	702,209	333	124	27.2	9
Central of New Jersey	1930 692	203,647	221,370	33,445	5,966	55.9	414,862	188,867	149	38	20.3	21
	1929 691	265,535	286,596	47,332	7,549	56.4	520,225	237,451	160	41	20.4	9
Chicago & Eastern Ill.	1930 946	195,830	196,533	2,940	4,857	61.1	313,185	134,259	91	59	39.1	35
	1929 946	238,340	239,387	2,694	6,381	62.9	389,888	172,242	101	66	39.6	28
Elgin, Joliet & Eastern	1930 453	111,657	116,035	5,671	2,824	58.5	226,949	109,258	75	19	20.6	10
	1929 453	128,236	137,573	7,169	3,442	59.1	266,660	134,046	73	16	17.6	2
Long Island	1930 400	45,674	49,385	11,305	589	53.5	42,052	15,611	38	8	18.1	..
	1929 400	49,944	54,255	16,561	565	55.2	36,880	13,517	42	7	14.4	..
Pennsylvania System	1930 10,675	3,415,000	3,839,952	381,367	114,924	59.0	7,929,029	3,443,944	2,339	307	11.6	699
	1929 10,738	4,112,891	4,696,598	454,304	136,704	59.2	9,457,684	4,201,717	2,433	356	12.8	394
Reading	1930 1,448	560,643	610,160	52,025	14,973	56.3	1,118,710	528,513	312	69	18.0	37
	1929 1,451	634,740	699,569	53,110	17,457	58.3	1,261,733	617,998	335	57	14.4	30
Pocahontas Region:												
Chesapeake & Ohio	1930 3,113	1,101,110	1,168,890	45,325	40,259	53.8	3,432,154	1,825,442	595	104	14.9	138
	1929 3,080	1,251,707	1,325,329	52,976	43,482	54.1	3,657,468	1,966,200	565	111	16.4	64
Norfolk & Western	1930 2,230	727,556	788,886	40,094	25,560	56.8	2,187,178	1,137,064	455	42	8.4	132
	1929 2,230	870,657	989,201	56,360	31,536	56.0	2,774,808	1,480,911	443	50	10.2	74
Southern Region:												
Atlantic Coast Line	1930 5,160	672,384	677,573	10,116	15,266	58.0	869,436	295,326	400	73	15.5	103
	1929 5,153	621,418	623,057	9,658	15,288	58.9	865,302	300,365	414	52	11.2	101
Central of Georgia	1930 1,900	221,735	222,465	3,714	5,155	65.4	289,359	111,255	119	30	19.9	7
	1929 1,900	254,547	256,057	4,642	6,296	67.2	343,347	137,522	132	20	13.2	5
Ill. Cent. (inc. Y. & M. V.)	1930 6,689	1,578,162	1,592,783	29,679	39,871	56.9	2,754,991	1,086,190	728	161	18.1	56
	1929 6,694	1,953,206	1,965,495	30,646	49,123	56.4	3,433,684	1,380,505	705	131	15.7	10
Louisville & Nashville	1930 5,249	1,285,728	1,360,568	37,367	26,767	56.7	1,911,254	889,448	571	131	18.6	119
	1929 5,247	1,526,384	1,611,993	47,404	31,487	56.8	2,232,327	1,043,026	579	117	16.8	30
Seaboard Air Line	1930 4,478	546,870	556,127	6,609	13,400	60.4	810,842	285,343	277	23	7.7	22
	1929 4,475	525,945	544,610	6,135	13,888	62.9	797,126	301,179	261	53	16.9	17
Southern	1930 6,676	1,271,392	1,292,073	23,421	29,157	62.0	1,682,098	640,981	820	171	17.2	207
	1929 6,679	1,461,116	1,490,882	31,848	35,274	61.1	2,027,260	784,588	831	128	13.3	150
Northwestern Region:												
Chi. & North Western	1930 8,459	1,142,275	1,187,409	26,089	28,398	61.4	1,720,493	666,965	729	132	15.3	149
	1929 8,475	1,338,377	1,397,928	26,075	32,164	59.9	2,027,494	788,022	755	99	11.6	79
Chi. Gt. Western	1930 1,459	263,177	284,557	25,557	8,172	59.6	580,006	179,649	92.8	15.2	14.1	1.9
	1929 1,459	300 135	339,190	19,756	8,347	59.5	578,099	185 658	119.3	21.7	15.4	20.0
Chi., Milw., St. P. & Pac.	1930 11,307	1,424,075	1,514,761	79,771	38,287	59.5	2,424,796	960,393	803	146	15.3	271
	1929 11,244	1,633,519	1,753,136	89,425	46,066	61.3	2,817,610	1,155,949	797	151	15.9	179
Chi., St. P., Minn. & Om.	1930 1,714	270,323	294,570	13,528	5,412	63.0	319,036	128,598	152	29	15.9	42
	1929 1,724	308,820	333,679	15,680	6,264	61.4	371,774	148,107	148	26	14.9	26
Great Northern	1930 8,334	761,427	773,762	30,144	26,519	67.6	1,581,278	704,767	482	141	22.6	88
	1929 8,340	856,505	885,178	58,608	30,117	68.1	1,769,611	807,361	490	130	20.9	43
Minn., St. P. & S. St. M.	1930 4,351	377,073	385,120	3,193	9,493	66.2	523,090	217,833	163	57	25.8	22
	1929 4,357	458,445	469,369	6,100	12,233	65.8	666,808	278,432	191	45	18.9	23
Northern Pacific	1930 6,473	674,197	718,908	49,470	20,901	65.3	1,245,298	514,840	391	117	23.0	38
	1929 6,468	786,335	829,668	47,803	24,651	66.6	1,424,140	606,539	430	106	19.9	50
Oreg.-Wash. R. R. & Nav.	1930 2,218	187,013	196,257	12,114	4,985	67.6	297,648	126,015	122	20	13.9	42
	1929 2,246	203,568	214,371	14,102	5,942	72.0	342,927	155,105	126	19	13.1	32
Central Western Region:												
Atch., Top. & S. Fe (incl. P. & S. F.)	1930 11,346	1,745,578	1,884,767	92,441	53,282	59.6	3,325,811	1,104,283	776	179	18.7	173
	1929 11,232	2,085,648	2,247,617	107,413	62,378	56.9	4,025,756	1,330,259	808	154	16.0	89
Chicago & Alton	1930 1,000	257,337	269,929	1,878	5,754	55.6	385,413	130,628	120	26	17.8	19
	1929 1,000	277,992	289,231	2,656	6,411	58.0	403,510	149,101	129	17	11.7	23
Chi., Burl. & Quincy	1930 9,274	1,274,494	1,325,326	52,296	38,286	58.1	2,397,028	1,054,482	618	154	20.0	31
	1929 9,309	1,464,693	1,543,458	65,340	44,692	60.0	2,749,193	1,232,163	663	150	18.4	22
Chi., Rock I. & Pacific	1930 7,593	1,120,819	1,157,918	7,742	27,650	59.9	1,701,846	648,941	523	151	22.4	123
	1929 7,592	1,453,499	1,520,304	11,310	32,912	57.0	2,093,441	795,756	546	115	17.4	53
Denver & R. G. Wn.	1930 2,524	318,026	356,996	46,793	8,077	57.1	522,285	200,495	233	16	6.4	33
	1929 2,564	352,020	413,893	67,195	8,981	62.4	549,122	232,648	228	43	15.7	16
Oregon Short Line	1930 2,537	336,558	349,140	23,392	10,062	60.7	657,375	262,735	175	5	2.8	42
	1929 2,539	358,663	373,427	27,966	10,448	64.2	661,018	279,540	191	10	5.0	43
So. Pacific—Pacific Lines	1930 8,984	1,299,596	1,394,445	153,280	39,825	61.2	2,461,129	833,476	713	233	24.6	200
	1929 8,969	1,618,534	1,760,525	223,656	47,668	59.9	3,031,346	1,103,191	752	174	18.8	102
Union Pacific	1930 3,765	1,123,453	1,147,646	52,772	39,911	58.5	2,501,171	827,415	434	35	7.5	117
	1929 3,765	1,300,225	1,334,527	60,237	41,234	61.0	2,512,074	876,194	451	29	6.0	82
Southwestern Region:												
Gulf, Colo. & S. Fe	1930 1,965	201,261	209,950	4,268	6,587	61.4	401,129	156,603	98	20	16.9	22
	1929 1,933	263,099	279,107	6,958	8,805	60.2	562,238	234,745	108	19	14.8	14
Mo.-Kans.-Texas Lines	1930 3,176	348,529	354,598	6,878	11,014	58.5	667,584	250,842	154	82	34.8	57
	1929 3,176	405,810	412,078	8,553	13,373	56.5	825,605	305,697	189	47	19.9	79
Missouri Pacific	1930 7,422	1,271,927	1,310,560	30,332	34,489	58.1	2,247,415	873,117	543	82	13.2	181
	1929 7,424	1,503,365	1,562,527	42,897	40,355	58.2	2,591,924	1,038,950	562	72	11.4	123
St. Louis-San Francisco	1930 5,169	670,886	678,617	9,373	16,630	59.8	1,026,718	389,394	392	77	16.4	57
	1929 5,213	895,082	909,852	11,146	20,076	57.1	1,261,948	481,479	386	70	15.4	11
Texas & New Orleans	1930 4,701	575,696	578,935	2,548	13,451	63.6	811,362	313,928	254	83	24.7	51
	1929 4,709	739,360	741,926	3,726	15,911	60.7	981,769	373,256	276	48	14.8	40
Texas & Pacific	1930 1,951	364,829	364,829	3,921	9,816	57.1	637,192	230,249	193	48	20.0	31
	1929 1,950	452,399	452,399	8,622	10,850	53.4	734,415	259,123	197	17	8.1	15

Compiled by Bureau of Statistics Interstate Commerce Commission. Subject to Revision

pared with November, 1929, for Roads with Annual Operating Revenue Above $25,000,000

Region, road and year	Average number of freight cars on line: Home	Foreign	Total	Per cent unserviceable	Gross ton-miles per train-hour, excluding locomotives and tenders	Gross ton-miles per train-mile, excluding locomotives and tenders	Net ton-miles per train-mile	Net ton-miles per loaded car-mile	Net ton-miles per car-day	Car-miles per car-day	Net ton-miles per mile of road per day	Pounds of coal per 1,000 gross ton-miles, including locomotives and tenders	Locomotive-miles per locomotive-day
New England Region:													
Boston & Albany.....1930	3,614	3,329	6,943	7.4	20,352	1,476	514	18.4	346	29.0	5,904	160	41.8
1929	3,448	4,483	7,931	6.6	18,367	1,259	454	19.2	390	31.2	7,593	179	64.7
Boston & Maine.....1930	11,267	9,139	20,406	7.7	23,230	1,838	688	20.8	381	27.9	3,758	112	47.6
1929	8,324	12,283	20,607	2.5	22,188	1,758	662	20.3	432	32.1	4,322	113	59.5
N. Y., New H. & Hart..1930	18,306	14,407	32,713	13.4	24,786	1,902	729	22.0	301	22.0	4,704	112	47.4
1929	15,715	17,498	33,213	9.1	23,403	1,821	715	21.6	352	25.3	5,558	113	59.5
Great Lakes Region:													
Delaware & Hudson.....1930	9,789	4,703	14,492	4.0	26,468	2,055	937	29.5	622	35.7	10,299	126	52.5
1929	9,550	5,728	15,278	3.3	25,139	1,996	929	29.6	666	37.2	11,622	126	60.3
Del., Lack. & Western...1930	17,919	6,004	23,923	5.7	25,334	1,906	757	23.0	430	28.8	10,308	146	58.9
1929	16,071	8,772	24,843	4.6	25,357	1,986	814	23.6	533	34.6	13,269	139	70.1
Erie (inc. Chi. & Erie)..1930	37,714	15,120	52,834	3.2	38,267	2,670	1,024	23.9	502	35.0	11,457	109	61.6
1929	31,885	21,682	53,567	3.8	34,727	2,580	1,001	24.3	568	39.8	13,137	113	68.3
Grand Trunk Western...1930	4,603	10,614	15,217	8.1	23,677	1,569	570	21.2	279	21.2	4,157	110	67.4
1929	4,060	12,146	16,206	5.3	22,578	1,654	594	21.2	324	25.5	5,298	110	70.6
Lehigh Valley 1930	20,555	7,881	28,436	7.4	27,537	1,903	781	25.2	419	26.2	8,677	151	50.4
1929	18,942	9,918	28,860	6.1	26,252	1,883	773	24.9	457	29.7	9,811	155	59.0
Michigan Central.....1930	24,904	14,985	39,889	5.3	33,074	1,922	658	20.3	223	18.5	4,769	113	64.6
1929	17,968	13,451	31,419	4.7	32,552	1,970	684	21.4	363	29.3	6,263	113	73.0
New York Central.....1930	79,280	63,642	142,922	7.4	32,911	2,311	934	25.6	563	25.3	8,454	105	50.1
1929	66,692	70,003	136,695	4.6	30,742	2,259	931	26.5	490	31.9	10,355	109	65.9
New York, Chi. & St. L..1930	16,172	8,645	24,817	6.9	27,815	1,819	640	21.0	469	37.9	7,011	108	71.2
1929	13,655	11,317	24,972	6.5	25,411	1,778	643	21.3	559	44.1	8,388	113	88.1
Pere Marquette 1930	11,767	5,597	17,364	3.1	22,599	1,517	583	24.6	385	27.2	3,034	103	62.8
1929	11,148	8,969	20,117	3.8	20,815	1,467	582	24.9	440	30.4	4,062	114	76.9
Pitts. & Lake Erie.....1930	17,661	5,768	23,429	5.4	37,277	2,903	1,582	44.5	211	8.4	21,338	113	45.5
1929	12,030	9,080	21,110	7.2	31,053	2,774	1,502	44.8	320	12.7	29,253	118	78.0
Wabash 1930	20,682	9,517	30,199	3.9	30,678	1,718	597	20.8	442	35.0	5,344	120	58.4
1929	16,399	13,989	30,388	1.9	28,139	1,660	597	21.4	515	39.9	6,271	126	78.6
Central Eastern Region:													
Baltimore & Ohio.....1930	80,406	23,961	104,367	5.6	24,955	2,072	902	30.2	439	25.2	8,276	152	55.8
1929	68,538	34,580	103,118	4.7	23,370	2,030	919	31.5	573	31.3	10,666	153	66.7
Big Four Lines.....1930	23,240	22,676	45,916	4.2	31,115	2,047	930	30.5	448	25.0	7,584	116	53.5
1929	21,858	24,367	46,225	3.9	27,911	1,978	857	29.4	506	29.7	8,614	122	64.1
Central of New Jersey...1930	17,121	8,638	25,759	7.1	25,008	2,037	927	31.7	244	13.8	9,094	147	45.3
1929	15,839	11,984	27,823	5.3	23,356	1,959	894	31.5	284	16.0	11,462	148	55.4
Chicago & Eastern Ill....1930	13,091	3,066	16,157	49.0	26,604	1,599	686	27.6	277	16.4	4,730	132	44.4
1929	12,308	4,285	16,593	42.3	26,192	1,656	723	27.0	346	20.4	6,068	133	48.5
Elgin, Joliet & Eastern..1930	9,722	5,339	15,061	4.7	15,538	2,033	979	38.7	242	10.7	8,043	128	43.2
1929	9,238	7,553	16,791	5.0	13,014	2,079	1,045	38.9	266	11.6	9,859	139	54.8
Long Island 1930	718	5,656	6,374	1.0	7,099	921	342	26.5	82	5.8	1,300	338	44.2
1929	754	5,499	6,253	1.2	5,621	738	271	23.9	72	5.5	1,126	408	48.5
Pennsylvania System.....1930	233,046	66,888	299,934	5.0	30,159	2,322	1,008	30.0	383	21.6	10,754	129	53.2
1929	206,439	85,185	291,624	4.4	27,664	2,300	1,022	30.7	480	26.4	13,043	133	61.6
Reading 1930	33,472	11,072	44,544	4.0	23,071	1,995	943	35.3	395	19.9	12,169	145	58.1
1929	26,280	16,712	42,992	5.1	21,641	1,988	974	35.4	479	23.2	14,192	145	64.1
Pocahontas Region:													
Chesapeake & Ohio.....1930	46,753	10,298	57,051	2.1	40,474	3,117	1,658	45.3	1,067	43.7	19,547	91	57.9
1929	36,712	14,268	50,980	2.5	36,969	2,922	1,571	45.2	1,286	52.6	21,276	92	68.0
Norfolk & Western.....1930	36,606	6,760	43,366	1.0	42,403	3,006	1,563	44.5	874	34.6	16,997	122	55.6
1929	29,214	9,509	38,723	0.8	43,143	3,187	1,701	47.0	1,275	48.5	22,140	123	70.7
Southern Region:													
Atlantic Coast Line.....1930	27,176	7,640	34,816	6.3	20,831	1,293	439	19.3	283	25.2	1,908	111	48.4
1929	23,009	8,341	31,350	4.5	20,328	1,392	483	19.6	319	27.6	1,943	109	45.3
Central of Georgia.....1930	7,256	2,781	10,037	12.2	21,386	1,305	502	21.6	369	26.2	1,952	139	50.9
1929	4,689	4,115	8,804	4.9	19,523	1,349	540	21.8	521	35.5	2,413	137	57.2
Ill. Cent. (inc. Y. & M. V.)1930	49,049	17,037	66,086	7.6	25,234	1,746	688	27.2	548	35.3	5,413	138	60.9
1929	41,954	23,902	65,856	3.4	24,095	1,758	707	28.1	699	44.1	6,874	139	79.6
Louisville & Nashville....1930	49,231	10,545	59,776	12.0	21,389	1,487	692	33.2	496	26.3	5,648	141	66.4
1929	44,975	14,631	59,606	9.8	19,751	1,462	683	33.1	583	31.0	6,626	148	79.5
Seaboard Air Line.....1930	16,810	6,071	22,881	3.9	21,201	1,483	522	21.3	416	32.3	2,124	131	62.6
1929	15,460	7,663	23,123	6.0	19,983	1,516	573	21.7	434	31.8	2,243	128	58.4
Southern 1930	53,964	13,646	67,610	13.1	19,962	1,323	504	22.0	316	23.2	3,200	158	44.3
1929	49,808	18,608	68,416	12.4	20,024	1,387	537	22.2	382	28.1	3,916	157	52.9
Northwestern Region:													
Chi. & North Western...1930	52,443	22,952	75,395	9.9	21,085	1,506	584	23.5	295	20.5	2,628	140	47.0
1929	48,452	28,090	76,542	7.4	19,908	1,515	589	24.5	343	23.4	3,099	142	55.6
Chi. Gt. Western.....1930	4,546	4,166	8,712	8.0	29,182	1,901	683	22.0	687	52.5	4,104	140	95.7
1929	5,819	4,598	10,417	6.6	24,153	1,687	619	22.2	594	44.9	4,241	144	84.9
Chi., Milw., St. P. & Pac. 1930	61,214	17,078	78,292	2.2	23,815	1,703	674	25.1	409	27.4	2,831	127	56.0
1929	53,100	22,471	75,571	2.7	22,845	1,725	708	25.1	510	33.2	3,427	133	64.8
Chi., St. P., Minn. & Om..1930	2,605	9,359	11,964	7.5	17,580	1,180	476	23.8	358	23.9	2,501	131	57.0
1929	2,500	9,351	11,851	6.9	15,952	1,204	480	23.6	417	28.7	2,864	132	67.2
Great Northern 1930	43,133	10,683	53,816	4.5	27,877	2,077	926	26.6	437	24.3	2,819	131	43.0
1929	40,716	13,669	54,385	3.5	25,971	2,066	943	26.8	495	27.1	3,227	141	50.8
Minn., St. P. & S. St. M..1930	20,227	3,785	24,012	4.2	19,034	1,387	578	22.9	303	19.9	1,669	108	58.8
1929	19,579	5,769	25,348	2.6	18,549	1,454	607	22.8	367	24.5	2,130	114	67.4
Northern Pacific.....1930	40,591	6,210	46,801	8.3	25,689	1,847	764	24.6	367	22.8	2,651	156	50.5
1929	36,910	7,925	44,835	7.2	24,184	1,811	771	24.6	451	27.5	3,126	160	54.6
Ore.-Wash. R.R. & Nav..1930	8,141	2,923	11,064	4.6	22,796	1,592	674	25.3	380	22.2	1,894	162	49.1
1929	7,373	3,425	10,798	3.1	22,469	1,685	762	26.1	479	25.5	2,302	168	52.6
Central Western Region:													
Atch., Top. & S. Fe (incl. 1930	65,139	15,205	80,344	7.4	31,634	1,905	633	20.7	458	37.1	3,244	111	69.0
P. & S. F.).....1929	57,577	22,011	79,588	5.7	29,728	1,930	638	21.3	557	45.9	3,948	117	81.6
Chicago & Alton.....1930	10,313	3,939	14,252	6.4	24,930	1,498	508	22.7	306	24.2	4,355	137	62.1
1929	9,527	4,570	14,097	4.7	22,668	1,452	536	23.3	353	26.1	4,971	148	66.6
Chi., Burl. & Quincy....1930	46,357	16,946	63,303	5.1	27,144	1,881	827	27.5	555	34.7	3,790	124	59.5
1929	42,728	21,357	64,085	4.3	25,829	1,877	841	27.6	641	38.7	4,412	131	65.9
Chi., Rock I. & Pacific..1930	37,067	14,141	51,208	8.3	22,521	1,518	579	23.5	422	30.0	2,849	143	57.7
1929	30,253	21,597	51,850	4.9	19,795	1,440	547	24.2	512	37.1	3,494	155	77.2
Denver & R. G. Wn.....1930	11,802	4,629	16,431	2.8	20,693	1,642	630	24.8	407	28.7	2,648	177	54.1
1929	11,328	6,098	17,426	2.7	18,046	1,560	661	25.9	445	27.5	3,025	189	59.2
Oregon Short Line.....1930	8,156	5,918	14,074	4.2	27,944	1,953	781	26.1	622	39.3	3,452	112	68.9
1929	8,280	5,634	13,914	2.8	25,404	1,843	779	26.8	670	39.0	3,670	118	66.7
So. Pacific—Pacific Lines.1930	41,971	21,542	63,513	9.7	27,514	1,894	641	20.9	437	34.2	3,092	123	54.5
1929	39,190	27,031	66,221	6.6	24,850	1,885	682	23.1	555	40.1	4,100	127	71.5
Union Pacific 1930	24,365	10,585	34,950	8.3	41,763	2,226	736	20.7	789	65.0	7,325	113	85.3
1929	20,089	11,128	31,217	5.0	35,105	1,932	674	21.2	936	72.1	7,756	121	96.9
Southwestern Region:													
Gulf, Colo. & S. Fe....1930	11,682	2,700	14,382	2.8	30,885	1,993	778	23.8	363	24.9	2,657	99	60.5
1929	10,863	5,309	16,172	3.8	31,370	2,137	892	26.7	484	30.1	4,048	98	75.0
Mo.-Kans.-Texas Lines...1930	14,379	5,856	20,235	5.1	28,264	1,915	720	22.8	413	31.0	2,632	96	51.0
1929	15,182	7,655	22,837	6.3	28,224	2,034	753	22.9	446	34.5	3,208	102	59.5
Missouri Pacific 1930	32,908	17,050	49,958	8.4	27,224	1,767	686	25.3	583	39.6	3,922	128	71.5
1929	29,230	26,210	55,440	4.2	23,877	1,724	691	25.7	625	41.7	4,665	135	84.3
St. Louis-San Francisco..1930	24,775	7,496	32,271	3.3	21,350	1,530	580	23.4	402	28.7	2,511	145	48.9
1929	23,159	10,781	33,940	3.2	19,054	1,410	538	24.0	473	34.5	3,079	156	67.3
Texas & New Orleans...1930	12,123	12,753	24,876	5.0	19,709	1,409	545	23.3	421	28.4	2,226	101	57.4
1929	11,173	15,659	26,832	3.4	18,320	1,328	505	23.5	464	32.6	2,642	105	76.6
Texas & Pacific 1930	6,317	4,675	10,992	7.8	24,541	1,747	631	23.5	698	52.1	3,933	96	50.9
1929	5,777	8,679	14,456	4.5	20,864	1,623	573	23.9	597	46.8	4,430	105	71.5

News

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a concern which is unable to maintain full or even part-time traffic departments may nevertheless obtain capable traffic direction through outside sources.

The report gives detailed consideration to the functions of industrial traffic departments, the cost of administration, and the relation of traffic management to purchasing, selling, accounting, advertising, and research.

The department was asked to make such a study by the Associated Traffic Clubs of America, and the report was made by Wayne E. Butterbaugh, lecturer in transportation at the University of Minnesota.

New York Central Revises Employee Safety Records

The New York Central has revised its accident statistics reports in order to require that all accidents, whether or not reportable to the Interstate Commerce Commission, will be listed for comparison among the various divisions of the road. This new policy, which is outlined in an article in the January issue of the New York Central magazine, requires that comparisons which are made by the general safety agent between the records of one division of the road and another, shall be made on the basis of the complete records. Each death resulting from an accident to an employee while on duty, or while off duty and rightfully on the company's premises, whether death occurs within 24 hours or otherwise, is to be included in the accident record of that road or division or other unit. This record is to be included in the month in which the death occurred, regardless of the date of the accident. Each principal injury, likewise, whether the employee is or is not able to continue at work, will be charged against that division or unit.

R. B. A. Opposes Government Ownership of Muscle Shoals

Volunteers who will work to prevent continued government ownership of Muscle Shoals and thus "halt government ownership before it spreads to railroads" are sought by Alba B. Johnson, president of the Railway Business Association in a recent statement to members. The statement of President Johnson is accompanied by a plan outlined by Frank W. Noxon, secretary of the association, under which it is suggested that business men could assist in the present Muscle Shoals discussion.

Mr. Noxon calls attention to a sentiment in Congress to concede certain points to the advocates of government ownership and operation of the Muscle Shoals power facilities and stresses the necessity for business men to get in touch with their representatives in Congress and thereby record their opposition to any extension of governmental competition with private enterprise. The statement also calls attention to the fact that in a referendum recently conducted by the United States Chamber of Commerce the participating national, state and city business bodies, by the overwhelming vote of 2640 to 157, favored sale or lease "as is" of the Muscle Shoals power plants and condemned government ownership of transmission lines. In view of this referendum Mr. Noxon urges members of the Railway Business Association to obtain necessary data from their local organizations and bring a united business sentiment forcibly to the attention of their legislators.

C. P. R. Earnings Up

Net earnings of the Canadian Pacific for November show a considerable improvement over those of that month in 1929. Gross revenues for the period showed a reduction of $1,340,082 at $14,781,111, while operating expenses were down $1,712,046 at $9,859,498, leaving net for the month at $4,921,612, against $4,549,649 in the corresponding period of 1929, an increase of $371,963.

For the eleven months, gross revenues were $165,576,335, a reduction of $29,636,388, while operating expenses at $130,489,196 were down $23,732,251 on a like comparison. Net revenues for the eleven month period were $34,087,139, a decrease of $5,904,136 from those of 1929.

The following table shows revenues, expenses and net for the month of November, and for the 11 months of the year ended with November:

	NOVEMBER		
	1930	1929	Decr.
Gross	$14,781,111	$16,121,194	$1,340,082
Exp.	9,859,498	11,571,544	1,712,046
Net	$4,921,612	$4,549,649	x$371,963
	ELEVEN MONTHS		
	1930	1929	Decr.
Gross	$165,576,435	$194,212,723	$29,636,388
Exp.	130,489,196	154,221,447	23,732,251
Net	$34,087,139	$39,991,275	$5,904,136

x Increase.

Number of Employees Again Reduced

A further reduction of 60,560 in the number of railway employees between the middle of October and the middle of November is shown in the Interstate Commerce Commission's preliminary statement of employment on Class I roads for November. The total as of the middle of November was 1,394,403, which was 17.05 per cent less than the number in November, 1929, and 17.02 per cent less than the number in November, 1928.

The total according to this latest statement is nearly one-third less than the number in service in November, 1920, when it was 2,068,454. In 1921, under the influence of a period of depression, there was a reduction of over 400,000 from the total left after the general adoption of the eight-hour day, but this was followed by an increase to an average of 1,857,674 in 1923. After this there was a gradual reduction and in November, 1929, the number was 1,681,027, while the average for 1929 was 1,660,920. Under the influence of the present depression there has been a further reduction of about 300,000.

The largest percentage now shown as compared with 1929, was in the maintenance of way and structures group, 26.74 per cent. In executives, officials, etc., it was 4.97 per cent; in professional, clerical and general employees, 10.67 per cent and in maintenance of equipment and stores employees 17.38 per cent. In the group of train and engine service employees the reduction was 14.21 per cent while in the number of yardmasters, switchtenders and hostlers it was 10.86 per cent.

Panama Canal Traffic for 1930 Lowest Since 1926

An estimate of last year's traffic through the Panama Canal, based on figures available for the first 29 days of December, indicates that there will be approximately 5,875 commercial transits during the year ending December 31, 1930, on which tolls amounting to approximately $26,106,900 will be collected, according to the Panama Canal Record. This will be the smallest calendar year's traffic since 1926, when 5,420 vessels, paying $23,901,540.04 in tolls, passed through the canal; and the smallest traffic for any 12-month period (fiscal or calendar year) since June 30, 1927, when a total of 5,475 vessels, paying $24,228,830.11 in tolls, transited the canal.

From July, 1927, up to the beginning of the current calendar year, transits failed to reach the 500 mark in only two instances; during 1930, however, transits have exceeded 500 in only three months, as follows: January, 531; March, 515; and October, 517.

For the calendar year 1930, it is estimated that the number of monthly commercial transits will average 489, as compared with 536 for 1929, 527 for 1928, 507 for 1927, and 451 for 1926.

The Wheat Situation in 1930

Failure of consumption to keep pace with production resulted in the great supply of wheat on hand in 1930 on record, both in the United States and throughout the world, according to a study just completed by the Bureau of Railway Economics. "The annual carry-over of wheat in the United States averaged 103,000,000 bushels at the beginning of the years 1923 to 1927, and amounted to 128,000,000 bushels in 1928, 247,000,000 bushels in 1929 and 275,000,000 bushels in 1930. Supply, that is production plus carry-over, which averaged 912,000,000 bushels in 1923 to 1927, increased to 1,043,000,000 bushels in 1928, to 1,053,000,000 bushels in 1929 and 1,115,000,000 bushels in 1930. Consumption, seed utilization, etc., has not kept pace with production, so that the world carry-over of wheat has increased almost every year, especially since 1924. The carry-over in the United States, which at the end of the year averaged 32.9 per cent of the world total during the five years, 1923 to 1927, amounted to 41.8 per cent in 1928 and 50.9 per cent in 1929." The average price paid to farmers in 1929-30 was 105.1 cents per bushel, which was 5 cents greater than in the previous year, but was 15.4 cents less than in 1927-28.

The bulletin says that there is no definite relationship between freight rates on wheat and the prices paid to the farmer. This study appears to warrant the conclusion that variations in the prices paid to the farmer during the

crop year 1929-30 were due to such economic factors as large supplies, reduced demand, favorable and unfavorable reports of weather and crop conditions both in the United States and elsewhere, and competition in the world market with wheat from other countries.

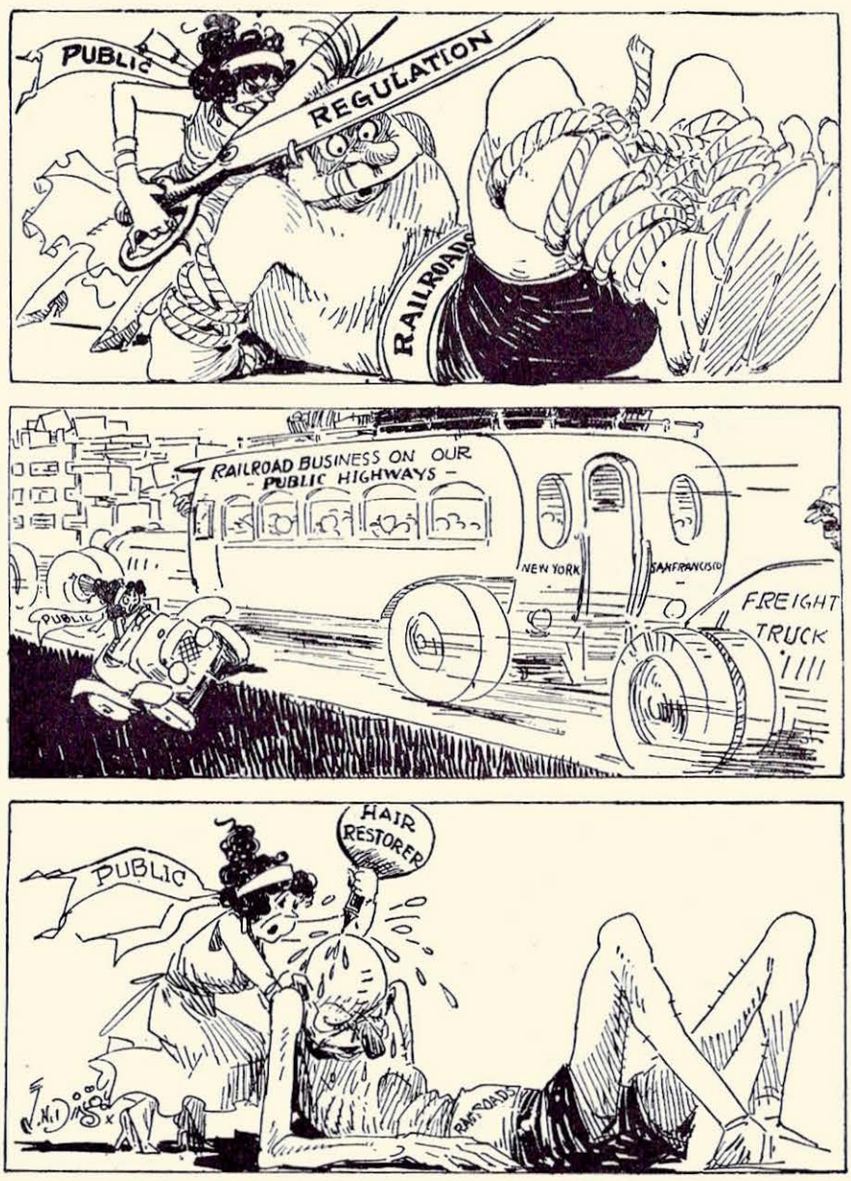
Georgia Labor Committee Sponsoring Highway Regulation

A bill designed to subject highway carriers of freight and passengers to more rigid regulation is being prepared for submission to the legislature of Georgia by a labor committee in that State, according to recent newspaper reports from Atlanta.

The announcement of the above-mentioned move was accompanied by a declaration of principles in which the labor committee pointed out that "bus and truck lines, left practically without regulation by public authority, have grown in extent and number to a point where unregulated and irresponsible operation on the public highways are a real and constantly growing menace to their patrons as well as the citizens out on the public roads for whose use and convenience these highways were proposed and out of whose pockets must come the tax money necessary for their construction."

Salient points of the bill to be drawn include regulation of passenger and freight traffic, inspection by competent authority of equipment used in passenger and freight transport, rigid examination of all operators of the vehicles and their qualification as to physical fitness, experience, age and character, regulation of hours of continuous service by such operators for protection of life and property against accidents due to fatigue induced by insufficient rest between trips, equitable taxation of motor vehicle owners in commercial transport to compensate for wear and tear on roads used by their equipment, posting of sufficient bond by such owners to insure payment of damage awards in accident cases, and limitation of weight and size of motor vehicles for protection of lives and property of other users of the highways.

* * * *



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Thus It Came to Pass that Delilah Started Buying Hair Tonic for Samson

Container Case Argued Before I. C. C.

(Continued from page 205)

leeway to vary from this as competition requires, subject to tariff publication but without the necessity for asking the commission to change its order in each case. C. S. Burg, general attorney of the Missouri-Kansas-Texas, spoke for the southwestern lines that are opposing the establishment of container service on the Missouri Pacific, while P. F. Gault, general attorney of the Chicago & North Western, spoke for the western trunk line roads that are also protesting. Arthur H. Brown, for the Cleveland Chamber of Commerce, said the shippers he represents think the container service a very fine thing and an excellent move on the part of the railroads toward meeting truck competition and that failure of the commission to allow its extension would be a serious blow against the introduction of new methods into railroad practice.

As the forwarding companies are large users of the container service, questions arose as to whether they are common carriers or shippers. Mr. Brown said he had no doubt they should be regulated as common carriers, as the commission has recommended in its annual report. Mr. Bikle said that while the forwarder's contract is rather to arrange for transportation than to carry, the forwarders might be regulated, even as to their charges, on the ground that their business involves such features of public concern. Mr. Larrimore said that as far as the railroads are concerned the forwarder is a shipper and the container should be treated as a commodity.

Questions were asked by the commissioners as to whether unjust discrimination is involved in according lower rates for shipments in containers than for l. c. l. shipments. Mr. Bikle pointed out that the difference is justified on a cost basis and said that the container rates afford an intermediate basis between the carload and the l. c. l. rates. Mr. Brown pointed out that container service enables a small community or small shipper that now cannot take advantage of the carload rates an opportunity to compete on more nearly even terms with the carload shipper. Mr. Burg said the southwestern lines consider the container to be an uneconomical type of service and that the rates proposed are unreasonably low and will cut both l. c. l. and carload rates. He contended that the container service will tend to intensify truck competition, on the ground that the service will be used almost entirely by the forwarders and that they will send container shipments to central points to be distributed by truck. He advocated regulation of the forwarding companies. Mr. Gault said the western trunk lines take the position that the Missouri Pacific tariff, which has been suspended, violates sections 1, 2, 3 and 15a of the interstate commerce act and support the findings of the examiner.

Supply Trade

Carl Haugaard has been appointed assistant treasurer of the **Harnischfeger Corporation**, Milwaukee, Wis.

Walter Harnischfeger, vice president of the **Harnischfeger Corporation**, Milwaukee, Wis., has been elected president and treasurer to succeed **Henry Harnischfeger**, deceased.

The Hobbs-Western Company, St. Louis, Mo., has been organized to conduct the business formerly handled by the **Western Tie & Timber Co.** and the **Hobbs Tie & Timber Co.**

O. Kuhler, railway and industrial advertising art and design engineer, has moved his office from Scarsdale, N. Y., to 921 Graybar building, New York City.

Harry W. King, head of the engineering department of the **Morgan Engineering Company**, Alliance, Ohio, has been appointed assistant vice-president of the **Aetna-Standard Engineering Company**, Youngstown, Ohio.

The Washington, D. C., office of the **American Steel Foundries** was discontinued on January 1, and the headquarters of **C. B. Peirce, Jr.** was transferred from that city to the office of the American Steel Foundries, 30 Church street, New York City.

The manufacture and distribution of Hackman trackliners and lining bars, heretofore handled by the **Hackman Railway Supply Company**, will hereafter be handled by the **Hackman Trackliner Company**, a newly organized company with headquarters at 431 South Dearborn street, Chicago, under the direction of **Clyde Tompkins**, sales manager.

The Milwaukee Electric Crane & Hoist Corporation, which has been operated as a subsidiary of the **Harnischfeger Corporation** since 1928, has been consolidated with the parent company and is being operated as the Milwaukee division. **D. E. Patterson**, general manager of the Milwaukee Crane and vice-president of the Harnischfeger Sales Corporation, is in charge of the crane and hoist sales.

Clifford L. Sheen, sales representative of the **American Locomotive Company** and **Railway Steel-Spring Company** at the San Francisco, Cal., district sales office has been appointed general sales representative on the Pacific Coast for both companies, with the title of district sales manager and headquarters at the present office in the Rialto building, San Francisco. **Otis R. Hale**, former district sales manager at San Francisco, has retired. Mr. Sheen, after completing an apprenticeship of four years in the shops of the Chicago & North Western at Clinton, Iowa, entered the service of the American Locomotive Company in 1920 and until 1925 served as an inspector in the various departments of the company's Cooke plant at Paterson, N. J., and later was appointed a traveling engineer for the company for service in South America. He subsequently served in the same capacity in the United States and since 1927 when he was transferred to the San Francisco district office, has served as a sales and service representative until his recent appointment as above noted.

OBITUARY

T. S. Leake, who retired as president of the T. S. Leake Construction Company, Chicago, in February, 1925, died suddenly on January 9, at San Diego, Cal.

William S. Bartholomew, retired president of the Locomotive Stoker Company and a retired vice-president of the Westinghouse Air Brake Company, who died on January 6, at his home, Pittsburgh, Pa., following a short illness from a heart attack, was born on November 17, 1864, at Warren, Ohio. Mr. Bartholomew received his early education at Detroit, and at Chicago, where he also later matriculated in Northwestern University. His first business training was received in the ship chandlery business from which he went to the Adams & Westlake Company, eventually becoming the company's eastern manager in Philadelphia. In 1903 he became associated with the

William S. Bartholomew

Westinghouse Air Brake Company as its New England representative at Boston, Mass., being transferred in 1905 to Chicago as its western manager. In 1913 he became president of the Locomotive Stoker Company, a subsidiary of the Westinghouse Air Brake, at Schenectady, N. Y., and since 1916, when the plant of that company was moved to Pittsburgh, Mr. Bartholomew has lived there. As executive head of the Locomotive Stoker Company Mr. Bartholomew developed the mechanical stokers used in locomotives throughout the United States and in foreign countries. In addition to these duties, in 1918 he became vice-president of the Westinghouse Air Brake Company in charge of sales. He retired in 1928.

Equipment and Supplies

FREIGHT CARS

The General Electric Company is inquiring for one transformer car of 150 tons' capacity.

The Sanitary District of Chicago is asking for prices on the repair of 15 air dump cars.

The Byllesby Engineering & Management Corporation, Chicago, is inquiring for five drop-bottom gondola cars of 70 tons' capacity.

The Fruit Growers Express has ordered 50 steel underframes for refrigerator cars from the Greenville Steel Car Company. Inquiry for this equipment was reported in the *Railway Age* of December 27.

IRON & STEEL

The Southern is inquiring for 35,000 tons of rail.

The Missouri-Kansas-Texas is inquiring for 10,000 tons of structural steel for a bridge at Boonville, Mo.

The Chicago, Burlington & Quincy is inquiring for 600 tons of structural steel for an express building at Chicago.

The Illinois Central has ordered 700 tons of structural steel for a bridge at Rockport, Ky., from the Virginia Bridge & Iron Co.

The Chicago, Burlington & Quincy has contracted for 36,500 tons of rails for the Burlington, the Ft. Worth & Denver City, and the Colorado & Southern for 1931, of which 3,200 tons are carried over from last year. A total of 17,200 tons has been ordered from the Colorado Fuel & Iron Co. of which 1,800 tons are carried over, 13,300 tons from the Illinois Steel Company of which 1,400 tons are carried over and 6,000 tons from the Inland Steel Company.

SIGNALING

The London & North Eastern has contracted with the Westinghouse Brake & Saxby Signal Company (London) for re-signaling work at Chesterton Junction; a 50-lever mechanical interlocking, including track circuit and other apparatus, and apparatus of the Westinghouse hand generator system for operating outlying switches and signals.

The L. & N. E. has also contracted with the same firm for re-signaling work at St. Ives; a 70-lever mechanical interlocking with all mechanical and electrical accessories. The details are similar to those at Chesterton except that outlying switches and signals will be operated by low-voltage apparatus.

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"SERVICEABLE!"

but are they

"PROFITABLE"

?

THE railroad that congratulates itself on possessing "serviceable" locomotives it can still run for many years is thinking in terms of the past.

Being serviceable; being able to haul a load of cars is not enough. To haul the load at a profit—the biggest possible profit—is the test of the fitness of motive power today.

The older locomotives may be in good mechanical condition; they may be only a few years old. But, if they fail to measure up to the performance of the modern Super-Power Locomotive, they are money wasters; exacting a continuing excess charge on the production of transportation—they are obsolete.

LIMA LOCOMOTIVE WORKS
INCORPORATED
LIMA - - - - - - OHIO

LIMA LOCOMOTIVE WORKS INCORPORATED

Construction

ATCHISON, TOPEKA & SANTA FE.—A contract for the construction of the substructure for a bridge over the Fountain river near Pueblo, Colo., has been awarded to the Pueblo Bridge & Construction Co., Pueblo.

CANADIAN NATIONAL.—A contract for grading and bridging for the construction of a double track cut-off around Brantford, Ont., about 6 miles long, has been awarded to the R. C. Huffman Construction Company, Toronto, Ont. The total cost of this project, including a number of grade separation structures, is estimated at $1,350,000. A contract for the substructure of a highway subway to carry this company's tracks over Simcoe street, Oshawa, Ont., has been let to Bathe & McLellan, Oshawa. This structure, which will provide for three railway tracks, will involve an expenditure of about $250,000. The contract for the construction of a concrete substructure for a 593-ft. railway viaduct at Sudbury, Ont., has been awarded to the Duncan Construction Company, Ltd., Sudbury. This structure will replace the present timber trestle.

CANADIAN PACIFIC.—A contract has been let to W. C. Arnett, Vancouver, B. C., for grading for the construction of a nine-mile branch line from a point near Skaha, B. C., around the west side of Skaha lake, to Okanogan Falls. The grading contract, which involves an expenditure of about $300,000, will include the excavation of 120,000 cu. yd. of solid rock, 45,000 cu. yd. of loose rock and 155,000 cu. yd. of hardpan. Tracklaying and ballasting will be undertaken by company forces following the completion of the grading about March 1. The total cost of the project will be about $650,000.

CHESAPEAKE & OHIO.—This company has authorized the extension of its eastbound passing track at East Alleghany, Va., at a probable cost of $49,300.

CHICAGO, BURLINGTON & QUINCY.—The general contract for the construction of an express terminal building in the area bounded by Roosevelt road, Taylor and Canal streets and this railroad's tracks at Chicago has been awarded to the J. B. French Company, Chicago. A contract for the construction of the foundation of the building has been let to G. A. Johnson & Son, Chicago. This structure, which will replace an express terminal already in service in that vicinity, will be used by the Railway Express Agency. It will include a two-story structure 310 ft. in length and a one-story portion 625 ft. long, and will be constructed of steel, brick and stone. With accompanying trackage and paving the total expenditure for the project will approximate $650,000. A contract for the construction of a fruit terminal building at Minneapolis, Minn., has been awarded to the Butler Manufacturing Company, Minneapolis. This structure will be a steel insulated building with outside dimensions of 200 ft. by 90 ft., representing an expenditure of about $75,000.

ERIE.—The Public Service Commission of New York has advised the Erie that it does not consider excessive the bid of $41,585 submitted by the Hecker-Moon Company, Cleveland, Ohio, for work in connection with the reconstruction of the highway bridge carrying the Kuders Corners-Springwater county highway over the Erie tracks in Conesus, N. Y.

LEHIGH VALLEY.—The New York Public Service Commission has ordered the reconstruction of the bridge carrying Erie Station road over this company's tracks in Henrietta, N. Y. The cost of the work is estimated at $57,800.

MILWAUKEE ELECTRIC RAILWAY.—This company has let a contract to Guehlsdorff & Heyer, Sheboygan, Wis., for the construction of a one- and two-story package freight terminal and motor coach garage at Sheboygan which will have outside dimensions of 180 ft. by 40 ft.

MISSOURI-KANSAS-TEXAS.—This company plans to take bids within about three months for the construction of the superstructure of its new bridge over the Missouri river at Boonville, Mo., the substructure of which is practically completed. The bridge will be made up of one 413-ft. draw span and three 303-ft., one 265-ft. and one 65-ft. fixed spans.

NEW YORK CENTRAL.—The New York Public Service Commission has designated for elimination the following grade crossings on this company's lines: Washington street, East Rochester, N. Y.; Dumonts crossing, Seneca Falls, N. Y.; Railroad street, Herkimer, N. Y.; Main street, Paterson, N. Y., and Howard road, Gates, N. Y. The first two crossings are to be eliminated by carrying the highways below the grade of the railroad, while the other three eliminations will be accomplished by carrying the highways over the tracks.

NEW YORK CENTRAL.—This company has awarded to the Frederick Snare Corporation, of New York, a contract for the construction of column foundations for a railroad viaduct on the west side of New York City, in connection with its West Side improvement program. Other contracts have recently been awarded by this company as follows: For the construction of a taxi garage at the central passenger station, Buffalo, N. Y., to the Hydro Construction Company of Buffalo; for the construction of a passenger station at Brewster, N. Y.; to Jones-Plato Co., Inc., White Plains, N. Y.; for the installation of foundations for, and erection of, moving cranes in New York City, to Edward J. Duffy Co., Inc., New York; for the construction of a sewer system at Burnet avenue, Syracuse, N. Y., to the Walsh Construction Company of Syracuse; for the elimination of a grade crossing at Culver road, South Utica, N. Y., to N. D. Peters & Co., Inc., of Utica; for the elimination of a grade crossing at Genesee street, Bowmansville, N. Y., to the John Johnson Construction Company, Buffalo, and for the reconstruction of bridge L-266 at Lackawanna, N. Y., to W. H. Gahagan, Inc., Brooklyn, N. Y. Plans submitted by the Syracuse Grade Crossing Commission showing changes in the location and use of existing tracks, switches and other railroad facilities of the New York Central in Syracuse, in connection with this company's general program of station improvements and grade crossing elimination in that city, have been approved by the Public Service Commission of New York. The revised plans provide for the construction of a single-track bridge across Park and Spring streets to provide a new passenger connection between the Rome, Watertown & Ogdensburg and Syracuse junction branches; for new team and holding yards to replace existing freight yards at Pearl street, and new connections with the tracks known as the First Ward branch. The new plans represent a cost of about $140,000 less than the original plans. The Public Service Commission has also advised the New York Central that it does not consider excessive the bid of the Walsh Construction Company, $124,309 for elimination of Buckhouts crossing, Briarcliff Manor, N. Y.

NEW YORK CENTRAL—PENNSYLVANIA LEHIGH VALLEY.—The New York Public Service Commission has directed that McKinley Parkway, Lackawanna, N. Y., be carried across the tracks of these three companies on a four-span girder bridge, 370 ft. long and estimated to cost about $352,000.

NEW YORK, NEW HAVEN & HARTFORD.—The Public Service Commission of New York has ordered the elimination of the Plattekill crossing of this company's tracks in Plattekill, N. Y., by carrying the highway over the present grade of the railroad near the existing crossing, at a probable cost of $112,000.

NORFOLK & WESTERN.—Authority has been issued for the construction of an overhead highway bridge east of Marion, Va., on this company's Bristol line.

PENNSYLVANIA.—Following completion of a large part of an extensive track elevation project, involving the elimination of 12 grade crossings and an expenditure of approximately $6,500,000, at Dayton, Ohio, this company plans to carry out without delay the remaining portion of the project, about one-fourth of the total. Trains are now operating over a part of the new elevated right of way. A contract has been awarded to Eugene F. Verga, Camden, N. J., for the construction of a subway under the Pennsylvania tracks at their intersection with state highway route S-41, about one-quarter mile west of Arch Street, and for alterations to a bridge over Pensauken Creek, Palmyra, N. J., at a total cost of $163,000.

PERE MARQUETTE.—A contract for the construction of a one-story repair shop for marine equipment at Ludington, Mich., has been let to Oscar Nelson, Ludington.

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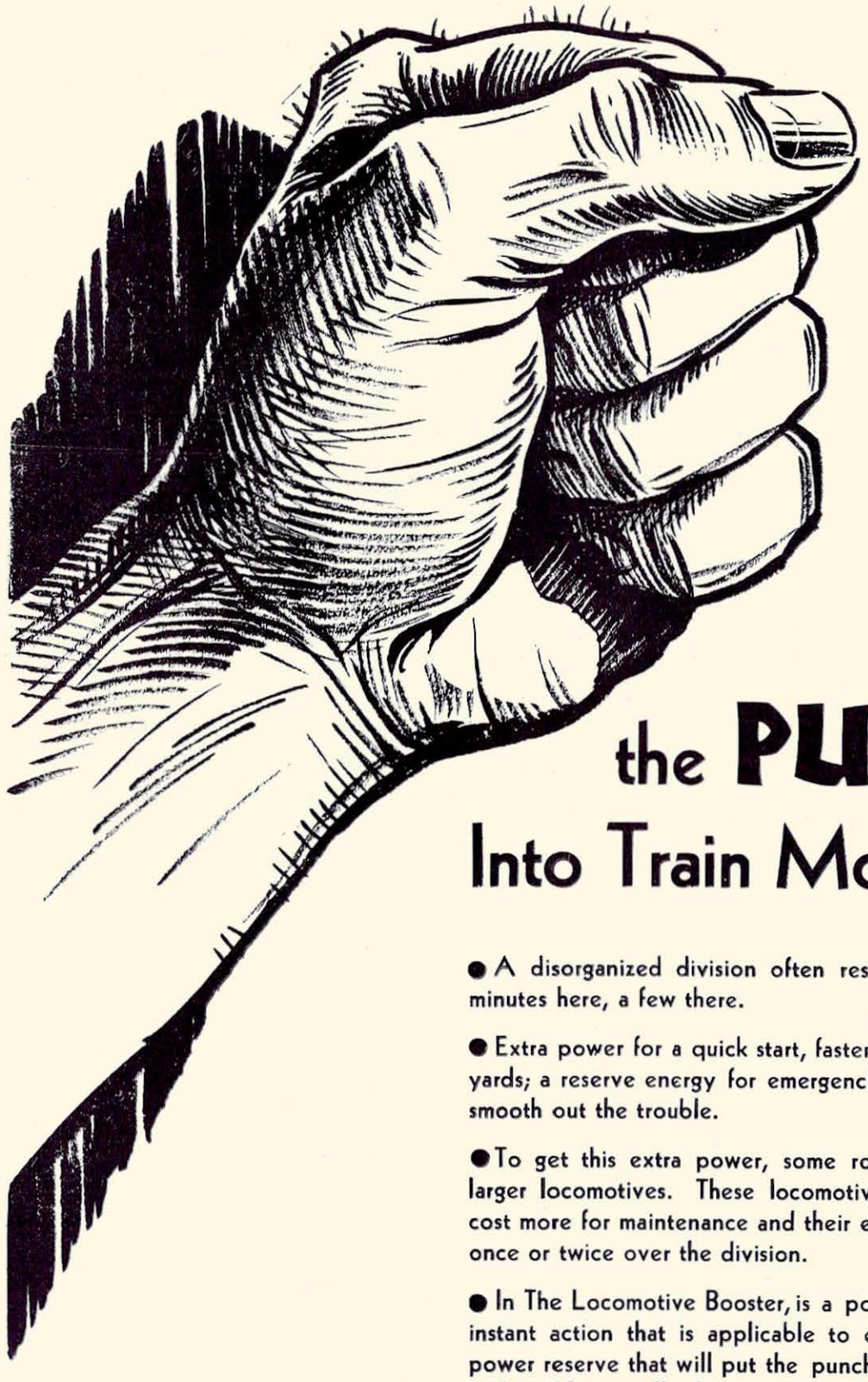

Put the PUNCH Into Train Movement

● A disorganized division often results from loss of a few minutes here, a few there.

● Extra power for a quick start, faster movement through the yards; a reserve energy for emergencies on the road would smooth out the trouble.

● To get this extra power, some roads have resorted to larger locomotives. These locomotives cost more to run, cost more for maintenance and their extra power is used but once or twice over the division.

● In The Locomotive Booster, is a power reserve ready for instant action that is applicable to every locomotive. A power reserve that will put the punch into train movement and enable a smaller locomotive to do a given job.

FRANKLIN RAILWAY SUPPLY COMPANY, Inc.

NEW YORK CHICAGO ST. LOUIS SAN FRANCISCO MONTREAL

Financial

BALTIMORE & OHIO.—*Equipment Trust Certificates.*—This company has applied to the Interstate Commerce Commission for authority for an issue of $3,000,000 of 4½ per cent equipment trust certificates.

BALTIMORE & OHIO.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority for the nominal issue of $2,728,000 of refunding and general mortgage 5 per cent bonds, to be pledged as security for short-term notes. Authority is also asked for an issue of a like amount of Toledo-Cincinnati division 6 per cent bonds, to be pledged under the refunding and general mortgage.

BALTIMORE & OHIO.—*Purchase of Chicago & Alton.*—A decree was entered in the United States District Court at Chicago on January 8 by Judge George A. Carpenter affirming the sale of the Chicago & Alton to Douglas M. Moffett and Colin C. Ives, representing the Baltimore & Ohio, under foreclosure proceedings at Wilmington, Ill., on December 11. Counsel representing the Levinson committee of stockholders of the Chicago & Alton were denied the right to file an intervening petition in the district court and it is expected that an appeal will be taken to a higher court. The district court also granted a petition assigning the road from the purchasers to the newly created Alton Railway Corporation which was incorporated in Illinois and Missouri on January 6 with a capitalization of $25,000,000, subject to previous obligations of $50,000,000. The officers of the new company are John P. Oleson, vice-president of the First National Bank of Chicago, president; Harry A. Wheeler, vice-chairman of the First National Bank, chairman of the board of directors; and Charles R. Holden, vice-president of the First National Bank, Robertson Griswold, vice-president of the Maryland Trust Company of Baltimore, Md., and Douglas M. Moffett of New York, vice-presidents.

CAPE FEAR RAILWAYS.—*Operation.*—The Interstate Commerce Commission has authorized this company to operate a 8.8-mile line in the Fort Bragg Military Reservation, N. C., 3.8 miles of the line being owned by the United States Government.

CHICAGO & NORTH WESTERN.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon a 9-mile line in Boone County, Ia.

CHICAGO GREAT WESTERN.—*Notes.*—The Interstate Commerce Commission has authorized this company to issue $461,550 of promissory notes payable to the order of the Lima Locomotive Works, Inc., in connection with the acquisition of six 2-10-4 locomotives. The notes include in the face interest on deferred installments amount and will bear interest after maturity of 4½ per cent. The locomotives are to be delivered to the railway on the following terms: $100 in cash on the execution of the lease, $24,000 in cash on the arrival of each locomotive and the total rent of the amount of the promissory notes to be paid in three installments of $153,800 each on December 26 of 1931, 1932 and 1933. None of the interest included in the principal nor in the face amount of these notes is to be charged by the railway to capital account. The railway, after meeting the rentals under the lease, may purchase the title to the locomotives for the sum of $289.45.

CHICAGO HEIGHTS TERMINAL TRANSFER.—*Bonds.*—The Interstate Commerce Commission has authorized this company to issue $562,000 of series A, first mortgage 6 per cent bonds, maturing in 1951. The issue is authorized for sale to Kuhn Loeb & Co., at 98, making approximate annual cost to the railroad 6.17 per cent.

DETROIT, TOLEDO & IRONTON.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon a branch line extending from Port William, Ohio, westerly to Kingman, 9.4 miles.

DOVER & SOUTH BOUND.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon as to interstate and foreign commerce its 24.8-mile line extending from Dover, N. C., southward to Richlands.

FLORIDA CENTRAL & GULF.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon as to interstate and foreign commerce its entire line of railroad extending from Inglis, Fla., to Herando, 29.5 miles, and to abandon operation under trackage rights over the Seaboard Air Line between a point between Dunnellon and Standard & Herando Junctions, 4.3 miles.

FONDA, JOHNSTOWN & GLOVERSVILLE.—*Acquisition and Operation.*—The Interstate Commerce Commission has authorized this company to acquire the railroad and other properties of the Gloversville & Broadalbin, a 6.2-mile line.

GREAT NORTHERN.—*Abandonment.*—Examiner O. D. Weed has recommended in a proposed report that the commission authorize the abandonment of the line from a point near Molson to a point near Oroville, Wash., 23.49 miles.

The railroads are entitled to the same square deal as their competitors are. They have been caught between excessive taxation and economically unsound competition. * * * The rapid extension of largely unregulated and inadequately taxed motor bus and truck services has cut deeply into their freight and passenger business. They have to meet competition by pipe lines in carrying oil. They are, finally, subjected to unfair competition by waterways improved at public expense.

All these handicaps have been met; and no country in the world gets better service from its railways, as a whole, than the United States does.

—Detroit Free Press

GROVETON, LUFKIN & NORTHERN.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line from Groveton to Vair, Tex., 22 miles, and also its operation over the Texas Southeastern to Lufkin, 12 miles.

ILLINOIS CENTRAL.—*Abandonment.*—The Interstate Commerce Commission has authorized the Helm Northwestern to abandon and the Yazoo & Mississippi Valley to abandon operation of the line of the Helm extending from the municipality of that name in Mississippi northward to Jacobs, 12.5 miles.

MISSOURI PACIFIC.—*Acquisition.*—This company has applied to the Interstate Commerce Commission for authority to acquire control of the Northeast Oklahoma by purchase of capital stock. The company operates an electric line from Columbus, Kan., to Miami, Okla., and has recently acquired properties of the Joplin-Pittsburgh with lines from Columbus to Cherokee, Kan., 15.77 miles, and from Scammon to Mineral, 5.61 miles.

NEW YORK CENTRAL.—*Bonds.*—J. P. Morgan & Co. and three other bankers are offering $5,000,000 of refunding and improvement mortgage 4½ per cent, series E, bonds of the Cleveland, Cincinnati, Chicago & St. Louis, due in 1977, at 100, the issue being subject to the approval of the Interstate Commerce Commission.

NEW YORK CENTRAL.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to sell to J. P. Morgan & Co., at 98 and interest $5,000,000 of refunding and improvement mortgage bonds of the Cleveland, Cincinnati, Chicago & St. Louis, the issuance of which was authorized by the commission in December.

NEW YORK CENTRAL.—*Bonds.*—The Interstate Commerce Commission has authorized the Cleveland, Cincinnati, Chicago & St. Louis to issue $5,000,000 of refunding and improvement mortgage, series E, 4½ per cent bonds to be delivered to the New York Central at par in reimbursement for expenditures in respect of maturing debentures. The New York Central is to assume obligation and liability for the bonds, which, it is said, it does not propose to dispose of immediately.

PENNSYLVANIA.—*Trackage Rights.*—The Interstate Commerce Commission has authorized this company to operate under trackage rights over the New York, Chicago & St. Louis between Farmdale, Ill., and Wesley Jct., 5.9 miles, and to construct a short connecting track.

PENNSYLVANIA.—*Operation.*—The Interstate Commerce Commission has authorized the Elmira & Lake Ontario to acquire the properties and franchises of

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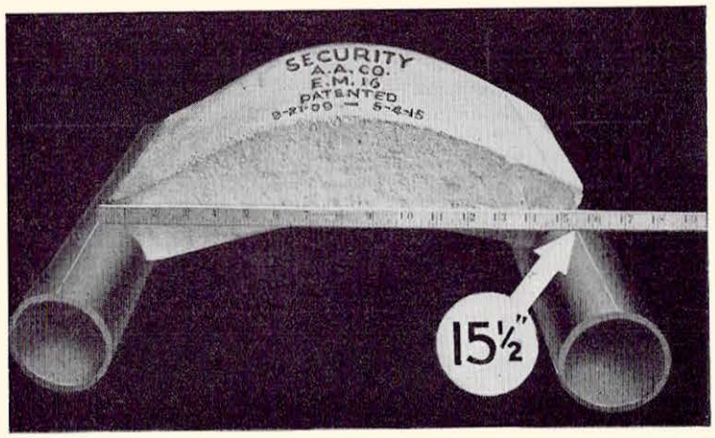
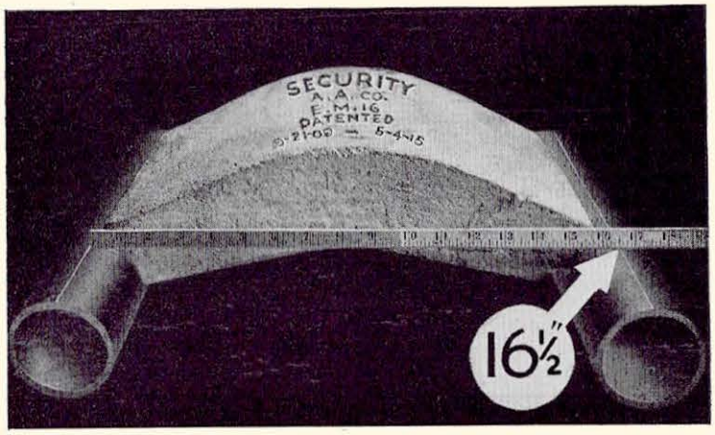
THERE'S MORE TO SECURITY ARCHES THAN JUST BRICK





"Bevelled End" ARCH BRICK has simplified brick stocks

● "Go-as-you-please" methods of locomotive Arch Brick design was creating a serious problem years ago when American Arch Company began its efforts to standardize Arch Brick.

Thanks to this work a handful of different shapes and sizes today meets any locomotive requirement.

In the elimination of unnecessary brick sizes, the development of "Bevelled End" Arch Brick by American Arch Company was important.

This made it possible to use the same Arch Brick even when Arch tube spacing varied as much as an inch. The number of Arch Brick needed to supply a shop was again reduced.

American Arch Company is constantly seeking ways of bettering Arch Brick service and reducing the number of brick shapes and sizes.

Harbison-Walker Refractories Co.
Refractory Specialists

American Arch Co.
INCORPORATED
Locomotive Combustion
. . . Specialists . . .

the Marion Railway, an 8.4-mile line in Wayne County, New York, the line to be operated by the Pennsylvania under an existing agency agreement. The new company is authorized to assume obligation and liability in respect of $45,700 of first mortgage 5 per cent bonds of the Marion Railway in connection with the purchase of its properties.

PITTSBURGH & WEST VIRGINIA.—*Notes.*—This company has applied to the Interstate Commerce Commission for authority to issue from time to time $2,200,000 of 4½ per cent promissory notes, in renewal of collateral notes for a like amount maturing January 30 and February 28, which were issued to provide funds for construction work.

ST. LOUIS-SAN FRANCISCO.—*Bonds.*—The Interstate Commerce Commission has authorized the Quanah Acme & Pacific to issue $746,000 of first mortgage 6 per cent bonds, the issue to be delivered to the St. Louis-San Francisco, $419,584 thereof being in repayment of capital advances and the remainder sold to the parent company at par.

ST. LOUIS SOUTHWESTERN.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to nominally issue $2,839,000 of first terminal and unifying mortgage bonds, to reimburse its treasury for expenditures for additions and betterments during 1929.

ST. LOUIS SOUTHWESTERN.—*Notes.*—This company has applied to the Interstate Commerce Commission for authority for an issue of $9,000,000 of 6 per cent notes maturing July 1, 1932, for the purpose of discharging outstanding bank loans. In connection with the explanation of this plan for temporary financing the application states that the company has authorized the creation of an issue of serial bonds limited to $100,000,000 to provide for the discharge of its floating debt, the ultimate retirement of the first terminal and unifying mortgage bonds and the payment of its first consolidated mortgage bonds maturing June 1, 1932.

TEXAS & PACIFIC.—*Bonds.*—J. P. Morgan & Co., Kuhn Loeb & Co., and five other bankers are offering $13,000,000 of this company's general and refunding mortgage 5 per cent bonds, series D, due in 1980, at 98½ to yield over 5.05 per cent. The issue is subject to the approval of the Interstate Commerce Commission.

Average Prices of Stocks and of Bonds

	Jan. 13	Last week	Last year
Average price of 20 representative railway stocks.	88.46	88.31	128.98
Average price of 20 representative railway bonds. . .	93.75	93.75	93.26

Dividends Declared

Cincinnati Northern.—6 per cent, payable January 31 to holders of record January 21.

Massawippi Valley.—3 per cent, payable February 1 to holders of record January 1.

Nashville, Chattanooga & St. Louis.—$2.50, semi-annually, payable February 2 to holders of record January 24.

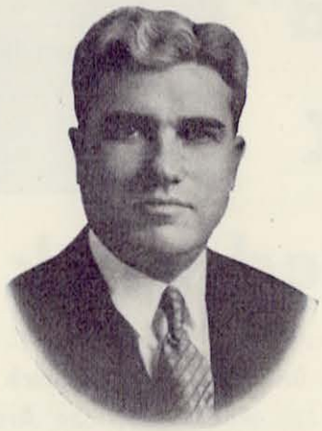
Virginian.—Preferred, $3.00, semi-annually, payable February 2 to holders of record January 17.

Railway Officers

EXECUTIVE

R. W. Wortham, receiver of the Paris & Mt. Pleasant, has been elected president, with headquarters as before at Paris, Tex. **Percy Jones** has been elected vice-president, with headquarters at Paris.

A. S. Baker, who has been appointed assistant to vice-president of the Baltimore & Ohio, with headquarters at Baltimore, Md., entered the service of the B. & O. as clerk in the general offices at Baltimore on April 1, 1907. On July 1, 1918, he became secretary to the federal manager of eastern lines, and on March 1, 1920, he was made secretary to the vice-president in charge of operation and maintenance. On April 16, 1920, he became secretary to the



A. S. Baker

vice-president in charge of traffic and on April 1, 1921, was promoted to assistant chief clerk, two years later he became chief clerk. Mr. Baker was promoted to division freight agent at Chillicothe, Ohio on June 1, 1927, and held the same position consecutively at Akron and Newark, Ohio.

Samuel T. Bledsoe, who in addition to his present position as general counsel of the Atchison, Topeka & Santa Fe, has been elected chairman of the executive committee of that railroad, with headquarters at New York, has been in railway service for 35 years. He was born in Clinton county, Ky., on May 12, 1868, and obtained his academic education at the Southern Normal School and Business College, Bowling Green, Ky., and at the University of Texas. Mr. Bledsoe first engaged in the practice of law at Sherman, Tex., in 1890. During the same year he moved to Ardmore, I. T. (now Oklahoma), where he was appointed local attorney for the Santa Fe in 1895. In 1908, he became solicitor for the Santa Fe in Oklahoma at Guthrie, Okla., being advanced to general attorney at Oklahoma City, Okla., in 1912. He was promoted to assistant general solicitor in 1915, with headquarters at Chicago, then being further promoted to general counsel of

Samuel T. Bledsoe

the Santa Fe and subsidiary companies in 1918. Mr. Bledsoe maintained his headquarters at Chicago until his election as chairman of the executive committee.

John L. Beven, vice-president of the Illinois Central, was elected senior vice-president on January 1, with headquarters as before at Chicago. The position of senior vice-president on that railroad has been vacant since the election of **A. E. Clift,** former senior vice-president, as president of the Central of Georgia early in 1929. **Robert V. Fletcher,** general counsel, with headquarters at Chicago, has also been elected vice-president.

Mr. Beven has occupied executive positions on the Illinois Central for the past 12 years, first as an assistant to the senior vice-president and to the president and since 1925 as vice-president. As assistant to the president he served under the late Charles H. Mark-

John L. Beven

ham, and was for a number of years his "right hand man." Mr. Beven was born at McComb, Miss., on February 17, 1887, and entered railway service in 1899 as a messenger on the Illinois Cen-

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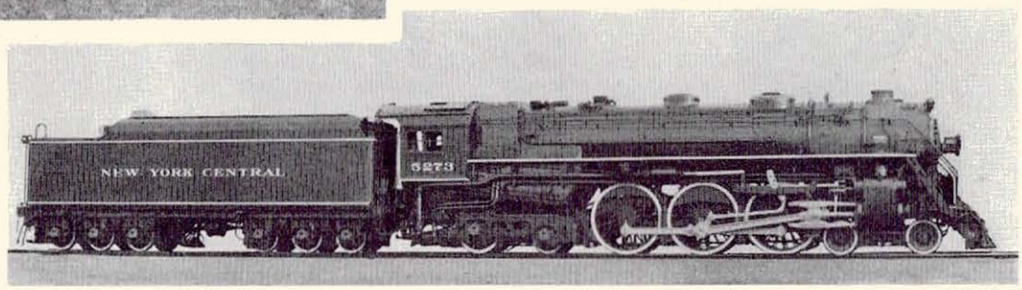
ALCO BUILT



Weight on Drivers, 188,500 pounds; Weight of Engine, 351,000 pounds; Cylinders, 25 x 28 inches; Diameter of Drivers, 79 inches; Boiler Pressure, 225 pounds; Maximum Tractive Power with Booster, 53,200 pounds.

An order for 40 more Hudson type locomotives has recently been received.

Compared with previous engines used in same service, the Hudson type combines greater starting tractive force, a substantial increase in cylinder horsepower capacity with the maximum output delivered at much higher speeds, a boiler of ample capacity to satisfy the cylinder requirements even under adverse conditions, weight distribution of such character as to keep rail stresses and rail impact loads within much lower limits, the avoidance at high speeds of high maximum and more or less isolated trailing wheel loads per pair of wheels, and firing rates within economical limits even under maximum power conditions.

A total of 225 Hudson types are now in service or under order for the New York Central Lines.

American Locomotive Company

30 Church Street New York N.Y.

tral. Later he was advanced successively to yard clerk, chief clerk to the superintendent and chief clerk to the general superintendent. In 1915 he was advanced to trainmaster at McComb, Miss., where he remained until 1917, when he was promoted to terminal sup-

R. V. Fletcher

erintendent at New Orleans, La. A year later he was appointed special assistant to the regional director of the Allegheny region of the United States Railroad Administration, then serving in a similar capacity in the Southern region organization. In 1919 Mr. Beven became assistant to the federal manager of the Illinois Central and at the return of the railroads to private control on March 1, 1920, he was appointed assistant to the senior vice-president, with headquarters at Chicago. Four years later he was promoted to assistant to the president, being elected vice-president in 1925, a position he held until his election to senior vice-president.

Mr. Fletcher has been at the head of the legal department of the Illinois Central since 1928. He was born in Grant county, Ky., on September 27, 1869, and graduated from Spencer Institute, Taylorsville, Ky., in 1886, later attending the University of Mississippi. He was admitted to the bar in Mississippi in 1898 and practiced law until 1906 as a member of the firm of Mitchell & Fletcher. From 1906 to 1909 he was successively assistant attorney general of the State of Mississippi, attorney general of that state and a judge of the Mississippi Supreme Court. In the latter year he entered railway service as a member of the firm of Flowers, Fletcher & Whitfield, acting as state attorney for the Mobile, Jackson & Kansas City (now part of the Gulf, Mobile & Northern). Mr. Fletcher was appointed general attorney of the Illinois Central in 1911, serving during federal control as assistant general counsel of the United States Railroad Administration at Washington, D. C. In 1920 he was appointed general solicitor of the Illinois Central at Chicago, being promoted to general counsel in 1928, a position he has occupied since that time.

Pitcairn Elected President of Detroit, Toledo & Ironton

N. B. Pitcairn, general superintendent of the Eastern Ohio division of the Pennsylvania at Pittsburgh, Pa., has been elected president of the Detroit, Toledo & Ironton at Detroit, Mich. Mr. Pitcairn was born on November 8, 1881, at Harrisburg, Pa. He was educated

N. B. Pitcairn

at Princeton University and entered railway service on June 29, 1901, as rodman on the Pennsylvania, serving consecutively to November 9, 1919, as rodman in the office of the chief engineer, transit man, assistant supervisor and supervisor at various points. On November 10, 1919, he was appointed division engineer on the Pittsburgh division. He was transferred to the Middle division the following year and in July, 1922, he was transferred to the New York division. In October, 1923, he was appointed superintendent of the Erie & Ashtabula division, later serving in the same capacity on the Middle division and the New York division. In July, 1928 when he became general superintendent of the Eastern Ohio division.

FINANCIAL, LEGAL AND ACCOUNTING

J. M. Nichols has been appointed auditor of the Mississippi Export, with headquarters at Moss Point, Miss.

O. B. Metje has been appointed assistant treasurer and auditor of the Jefferson Southwestern, with headquarters at Mt. Vernon, Ill.

John R. Downing has been elected treasurer of the Kentucky & Indiana Terminal, with headquarters at Louisville, Ky.

M. L. Bluhm, assistant general solicitor of the Chicago, Milwaukee, St. Paul & Pacific, has been promoted to general attorney, with headquarters as before at Chicago.

V. J. Gallaher has been appointed acting auditor and acting general freight and passenger agent of the Galveston, Houston & Henderson, with headquarters at Galveston, Tex.

G. C. Brooks, assistant general freight agent of the Quebec Central, has been appointed freight accountant and freight claim agent with headquarters at Sherbrooke, Que.

James A. Simpson has been appointed treasurer of the Southern Pacific, with headquarters at New York, succeeding **George M. Thornton,** retired, and **E. J. Goodwin** has been appointed to succeed Mr. Simpson as assistant treasurer. Mr. Goodwin will retain his position as transfer agent in addition to his new duties.

B. Newhouse, auditor of revenues of the Minneapolis, St. Paul & Sault Ste. Marie, has been appointed general auditor, in charge of revenue and station accounts, with headquarters as before at Minneapolis, Minn. **J. P. Tonolli,** ticket auditor, has been appointed freight and ticket auditor, succeeding **R. A. Mueller,** freight auditor who has resigned.

The jurisdiction of **E. M. Thomas,** comptroller of the Chesapeake & Ohio, with headquarters at Richmond, Va., has been extended over the Pere Marquette. In this added jurisdiction, Mr. Thomas succeeds **Clarence S. Sikes,** who retired from active service as comptroller of the Pere Marquette, with headquarters at Detroit, Mich., on January 1 at his own request. **A. C. Rhodes,** assistant comptroller of the Pere Marquette, has been appointed general auditor of that railroad, with headquarters as before at Detroit.

Thomas R. Woodrow, a member of the legal staff of the Denver & Rio Grande Western, has been appointed general attorney, with headquarters at Denver, Colo., succeeding **Elroy N. Clark,** who retired from railroad service on January 1 to open offices at Denver for the general practice of law. Mr. Clark is a native of Vermont and a graduate of the University of Vermont and Georgetown University. He entered railway service in 1898 as an attorney for the Rio Grande, later acting in this capacity also for the Chicago, Burlington & Quincy. In 1906 Mr. Clark was appointed general attorney of the Denver & Rio Grande. During the period of federal control of the railroads he acted as general solicitor of that railroad.

OPERATING

W. S. Joy, trainmaster of the Western division of the Southern Pacific at Oakland Pier, Cal., has been transferred to the Stockton division at Tracy, Cal.

F. W. Pettibone, general manager of the Oregon & Northwestern, with headquarters at Burns, Ore., has been appointed executive general agent, with headquarters at Portland, Ore. **Thomas S. Whitten** has been appointed general manager, succeeding Mr. Pettibone.

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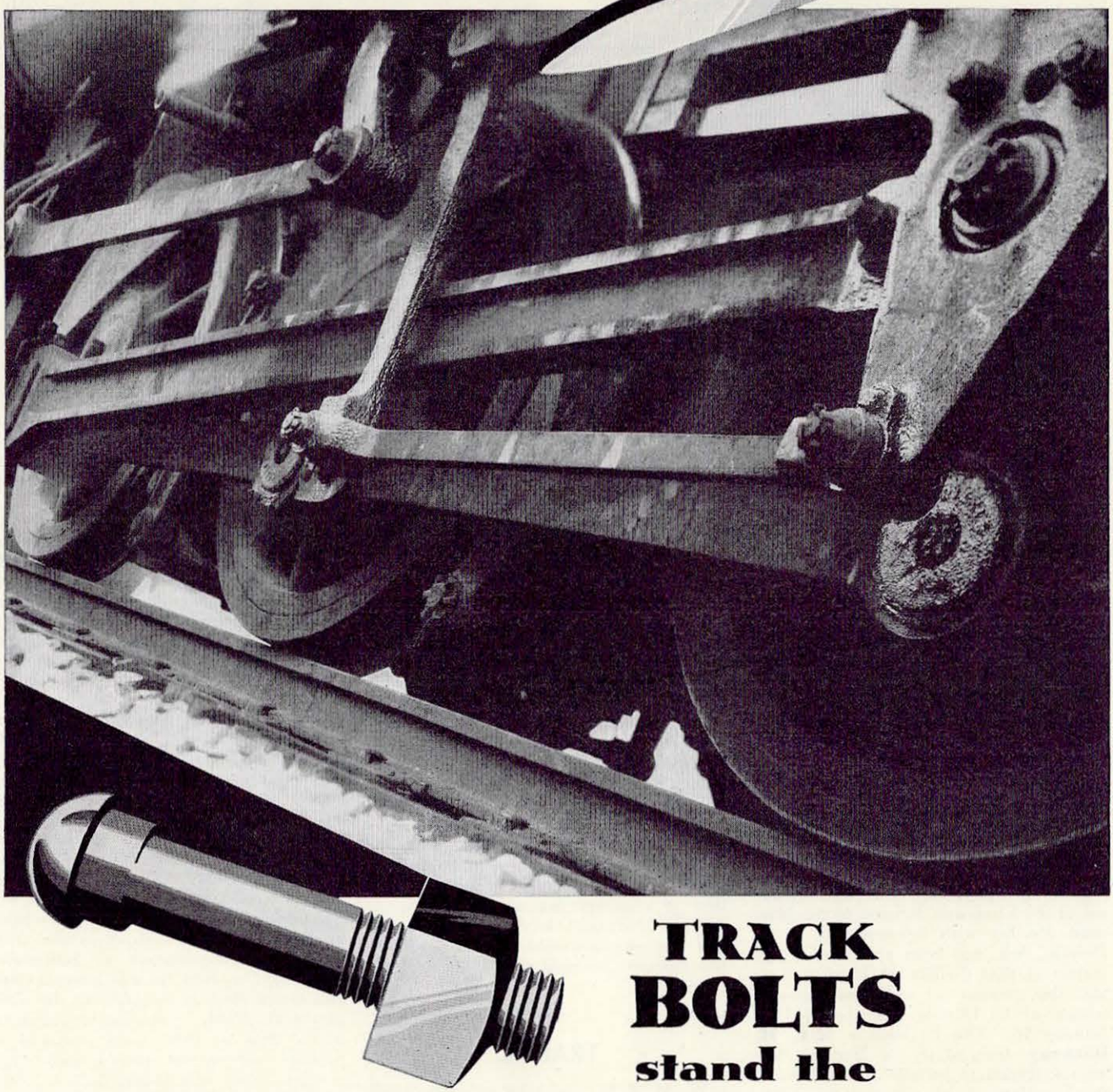
ILLINOIS SPIKES & TRACK BOLTS



stand the punishment of modern high-speed service

Illinois Steel Company

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

208 South La Salle Street :: Chicago, Illinois

J. N. Haines, general superintendent of transportation of the Lehigh Valley has been appointed general manager, with headquarters at Bethlehem, Pa., succeeding **J. F. Maguire,** who has been retired at his own request. The office of general superintendent of transportation has been abolished.

The jurisdiction of **U. W. Edmonds,** superintendent of the Peoria division of the New York, Chicago & St. Louis, with headquarters at Lafayette, Ind., has been extended to include the Indianapolis division. **E. S. Kirby,** superintendent of the Indianapolis division, with headquarters at Tipton, Ind., has been appointed assistant superintendent of that and the Peru divisions, with headquarters at Peru, Ind.

P. F. McManus, general manager of the Elgin, Joliet & Eastern, with headquarters at Joliet, Ill., has been granted an indefinite leave of absence on account of ill health, and the duties of general manager were assumed by **S. M. Rogers,** vice-president, with headquarters at Chicago, on January 1. **J. E. Reilly,** superintendent of the Joliet division, has been promoted to general superintendent, with headquarters as before at Joliet.

J. C. Rill, superintendent of the Philadelphia Terminal division of the Pennsylvania at West Philadelphia, Pa., has been promoted to general superintendent of the Eastern Ohio division, with headquarters at Pittsburgh, Pa., succeeding **N. B. Pitcairn,** who resigned on January 16. **Raymond Swenk,** superintendent of the Cleveland division, with headquarters at Cleveland, Ohio, has been transferred to the Philadelphia Terminal division, succeeding Mr. Rill. **J. C. Poffenberger,** superintendent of the Monongahela division, with headquarters at Uniontown, Pa., has been transferred to the Cleveland division to replace Mr. Swenk. **J. C. White,** division engineer of the New York division at Jersey City, N. J., has been promoted to superintendent of the Monongahela division, succeeding Mr. Poffenberger.

B. C. Murphy, assistant superintendent of the Louisiana division of the Missouri Pacific, with headquarters at El Dorado, Ark., has been appointed trainmaster of that division at Monroe, La., and the position of assistant superintendent at El Dorado was abolished on January 16. The jurisdiction of **C. H. Dunaway,** trainmaster at Monroe, has been extended to include all districts of the Louisiana division except the Alexandria terminal. **J. C. King** has been appointed assistant trainmaster of the Ferriday district of the Louisiana division including Natchez yard and Natchez and Louisiana transfer, with headquarters at Ferriday, La. **M. F. McKnight,** trainmaster of the Pine Bluff, McGehee and Benton districts of the Little Rock division, has been assigned to other duties and the jurisdiction of **B. W. Moore,** trainmaster, has been extended to include all districts of the Little Rock division, with headquarters at McGehee, Ark.

Robert L. Pearson, chief engineer of the New York, New Haven & Hartford, was appointed assistant general manager effective January 1. Mr. Pearson was born on April 2, 1882, at Philadelphia, Pa. He was educated at Swarthmore College and entered railway service in June, 1903, as transitman for the American Railways Company. He entered the service of the New Haven in 1904 as inspector in the construction department, later in the same year he became transitman in that department, where he served until 1907, at which time he was transferred to the maintenance department in the same capacity. In October, 1908, Mr. Pearson was appointed assistant engineer and in September, 1914, he became track supervisor. Two years later he was appointed division engineer in the maintenance department. From October, 1917 to September, 1918, Mr. Pearson was with the U. S. Shipbuilding Company at Hog Island, returning to the New Haven on the latter date as division engineer, also serving in the same capacity on the Central New England Railroad. He was appointed maintenance engineer for these two roads in 1921, and in 1923 he was advanced to the position of engineer maintenance of way, holding that post until October, 1929, when he was promoted to chief engineer, the position he held up to his present promotion.

R. L. Pearson

TRAFFIC

W. M. King, has been appointed district freight agent of the Southern with headquarters at Philadelphia, Pa., succeeding **H. W. Bondurant,** promoted.

C. P. Bowsher, northern traffic representative of the Missouri-Kansas-Texas at Chicago, has been appointed general northern agent at the same point.

James Maney, general passenger agent of the Duluth, South Shore & Atlantic and the Mineral Range, has been appointed general freight and passenger agent, with headquarters as before at Duluth, Minn.

O. B. Durand, general agent of the freight department of the Canadian National at Detroit, Mich., has been transferred to Chicago. **G. O. Thoresen** has been appointed general agent of the freight department at Detroit, succeeding Mr. Durand.

J. T. Hawkins, freight accountant and freight claim agent of the Quebec Central, has been appointed general freight agent and **W. E. A. Brooks,** assistant general passenger agent has been appointed general passenger agent. Both will have headquarters at Sherbrooke, Que.

W. R. Cox, freight traffic manager on the Pennsylvania at Pittsburgh, Pa., has been promoted to traffic manager at Chicago, effective January 16. **W. P. Veit,** division freight agent at Baltimore, Md., has been promoted to general freight agent at Cincinnati, Ohio, succeeding **W. W. Finley, Jr.,** who has been transferred to Philadelphia, Pa. Mr. Finley replaces **W. McL. Pomeroy,** who has been promoted to freight traffic manager at Pittsburgh, succeeding Mr. Cox.

Effective January 16, **W. R. Cox,** freight traffic manager of the Pennsylvania at Pittsburgh, Pa., will become traffic manager at Chicago and **W. McL. Pomeroy,** general freight agent at Philadelphia will succeed Mr. Cox as freight traffic manager at Pittsburgh. **W. B. Hopkins,** assistant general freight agent, will become general freight agent at Philadelphia, and **Fred Carti,** division freight agent at Wheeling, W. Va., will become assistant general freight agent at Philadelphia.

Charles Herbert Pumphrey, assistant to vice-president of traffic and commercial development of the Baltimore & Ohio, has been appointed freight traffic manager at Pittsburgh, Pa. Mr. Pumphrey was born on May 25, 1884, at Baltimore, Md., received his education in the public schools of Baltimore and at Baltimore City College, and entered railroad service on July 1, 1901, with the Baltimore & Ohio. From 1901 to 1917, he filled various positions in the general freight department at Baltimore. From 1917 to 1918, he was general clerk and senior clerk in the office of the vice-president, traffic, and federal manager. From 1918 to 1919, while engaged in military service, he served with engineering corps and transportation corps in France as lieutenant and captain, occupying the post of assistant to general manager, Service of Supply. In 1920, he returned to the B. & O. as district freight agent at Philadelphia, Pa. From 1921 to 1924, he was division freight agent at Youngstown, Ohio, and at New York. In 1924 he became assistant general freight agent at Louisville, Ky., and in 1926, assistant to vice-president, traffic and commercial development, at Baltimore, Md., the position he held at the time of his promotion, on December

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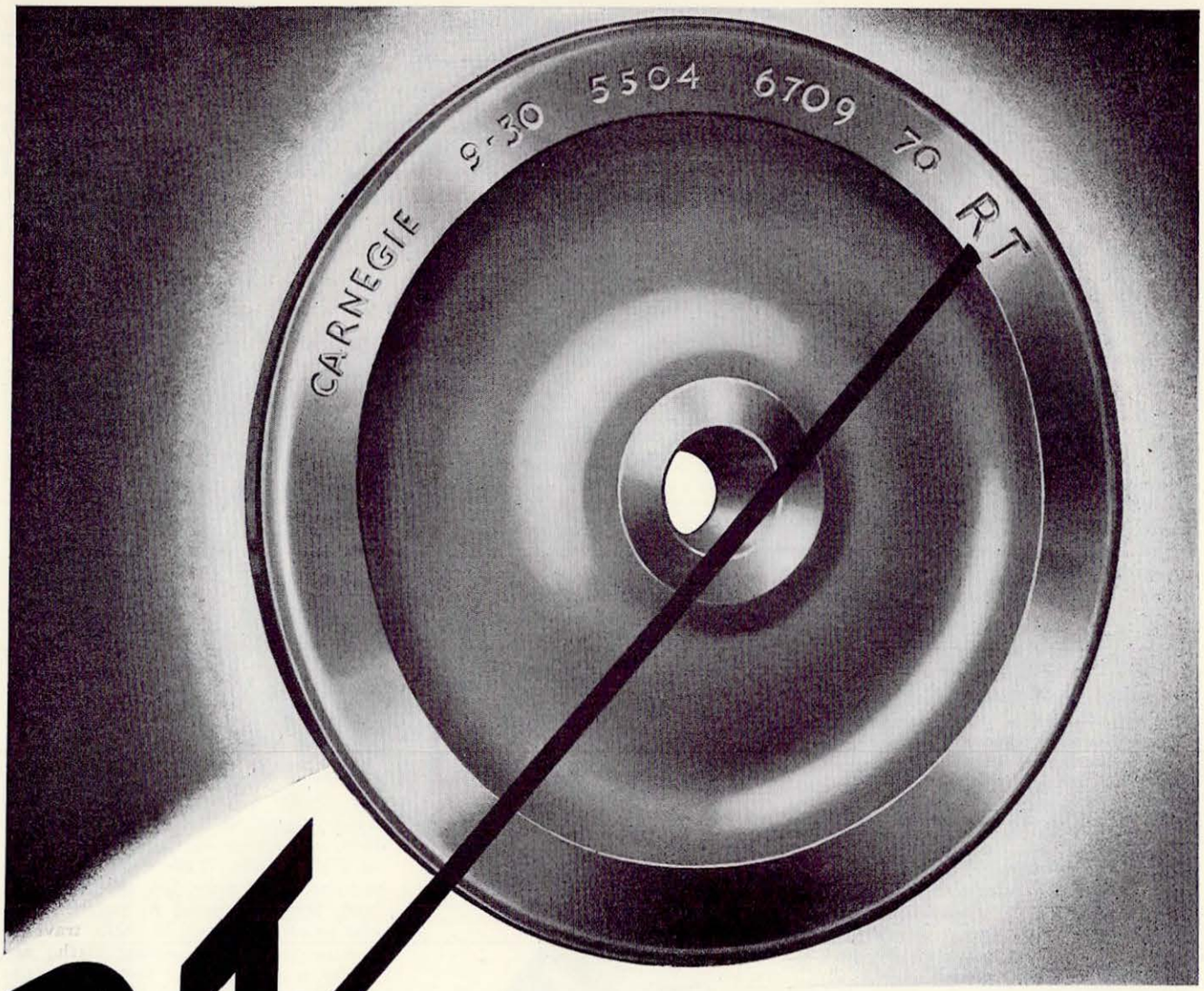

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Our wheel engineers are at your service.

CARNEGIE WROUGHT STEEL WHEELS

Product of Carnegie Steel Company, Pittsburgh, Pa. U S STEEL *Subsidiary of United States Steel Corporation* 115

16, 1930, to freight traffic manager at Pittsburgh.

M. H. Jacobs, general freight agent of the Western Maryland, has been appointed freight traffic manager with headquarters at Pittsburgh, Pa., as before. Mr. Jacobs was born on August 12, 1877, at Waynesboro, Pa., and began his railroad service with the Western Maryland on October 1, 1893. On December 26, 1900, he was appointed city ticket agent and rate clerk at Baltimore, Md., and on February 1, 1904, was assigned to the position of soliciting freight agent. From September 1, 1908, to August 1, 1912, he was traveling freight agent and on the latter date became general agent at Pittsburgh. On November 1, 1913, he was promoted to assistant general freight agent and on July 25, 1918, he was transferred to Uniontown, Pa., as division freight agent. From February 20, 1920, to date, he has been located at Pittsburgh, Pa., and at that point has served successively as assistant general freight agent and general freight agent, relinquishing the latter position on December 1, 1930, to undertake the duties of freight traffic manager.

Winfield Scott Burton, general foreign freight agent of the Western Maryland, has been appointed foreign freight traffic manager with headquarters at Baltimore, Md., as before. Mr. Burton was born on October 29, 1880, at Greenwood, Md., and received his education at the public schools at Baltimore, Md., the Baltimore City College and the Baltimore Polytechnic Institute. He entered railway service with the Baltimore & Ohio as messenger in the agent's office at Camden Station on April 26, 1898. From 1898 to 1902 he served successively as bill clerk, revenue clerk, voucher clerk, assistant statistician and claim investigator at Baltimore. On October 17, 1903, he was transferred to Cleveland, Ohio, as assistant to cashier in the agent's office, and on January 31 of the following year he became claim clerk. From 1904 to 1912, he was located at Pittsburgh, Pa., and while there held the positions of statistician, assistant claim clerk, trace and reconsigning clerk, rate clerk, and assistant chief clerk. On January 1, 1914, he entered the service of the Western Maryland and since that time has been located at Baltimore. From January 1, 1914, to September 1, 1916, he was chief clerk in the general freight office; from September 1, 1916, to July 1, 1918, freight tariff agent; from July 1, 1918, to January 15, 1920, assigned to special rate work, and from 1920 to date has served successively as freight tariff agent, division freight agent, foreign freight agent and general foreign freight agent, the position he held at the time of his recent promotion on December 1, 1930, when he became foreign freight traffic manager.

Winfield Scott Burton

C. J. Collins, general passenger agent of the Union Pacific System, has been promoted to assistant passenger traffic manager, with headquarters as before at Omaha, Neb. **John P. Cummins,** assistant to the passenger traffic manager at Omaha, has been promoted to general passenger agent, succeeding Mr. Collins. **L. E. Omer,** assistant general passenger agent at Omaha, has been promoted to assistant to the passenger traffic manager, replacing Mr. Cummins.

Mr. Collins has been in the service of the Union Pacific for 18 years. He was born at Columbus, Ohio, and entered railway service in 1907 as a ticket seller at the Union station at that point. Two years later he became assistant ticket agent for the Pennsylvania at Columbus, and in 1910 was advanced to city passenger agent. Mr. Collins entered Union Pacific service in 1913, as traveling agent at Cincinnati, Ohio, and from 1912 to 1920 he was representative and then manager of the Union Pacific-Chicago & North Western department of tours at Chicago. He was promoted to general passenger agent of the Union Pacific at Portland, Ore., in 1926, and transferred to Omaha in 1927. His further promotion to assistant passenger traffic manager became effective on January 1.

C. J. Collins

Mr. Omer was born at Camp Point, Ill., on December 11, 1884, and obtained his first railway experience as assistant agent and telegraph operator on the Wabash at Clayton, Ill., in 1901. Later he served as operator, agent, and cashier on the Minneapolis, St. Paul & Sault Ste. Marie at Apollonia, Wis., and Bruce, as operator and cashier on the Spokane & Inland Empire at Rosalia, Wash., and Moscow, Idaho, as operator and cashier on the Springfield & Illinois Southern (now part of the Baltimore & Ohio), as a brakeman on the Great Northern and as a clerk in the accounting and in the passenger departments of the Union Pacific at Portland. In 1916, Mr. Omer was advanced to traveling freight agent at Spokane, Wash., and then transferred to Calgary, Alta., and to Walla Walla, Wash. In 1918 he was appointed city passenger agent at Portland, being promoted to assistant general passenger agent in 1927. His further promotion to assistant to the passenger traffic manager became effective on January 1.

L. E. Omer

Mr. Cummins has been connected with the Union Pacific for 25 years, entering railway service with that road as a clerk in the office of the auditor of passenger accounts at Omaha. From 1907 to 1913, he served in a number of minor positions in the ticket office at Denver, Colo., and in the office of the director of traffic at New York. He

John P. Cummins

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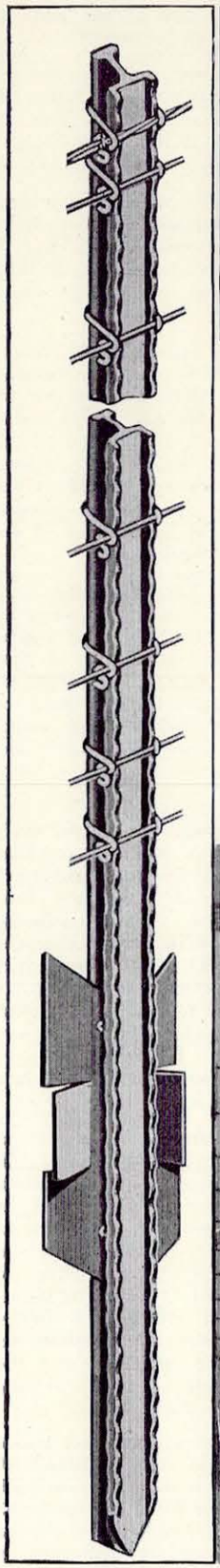

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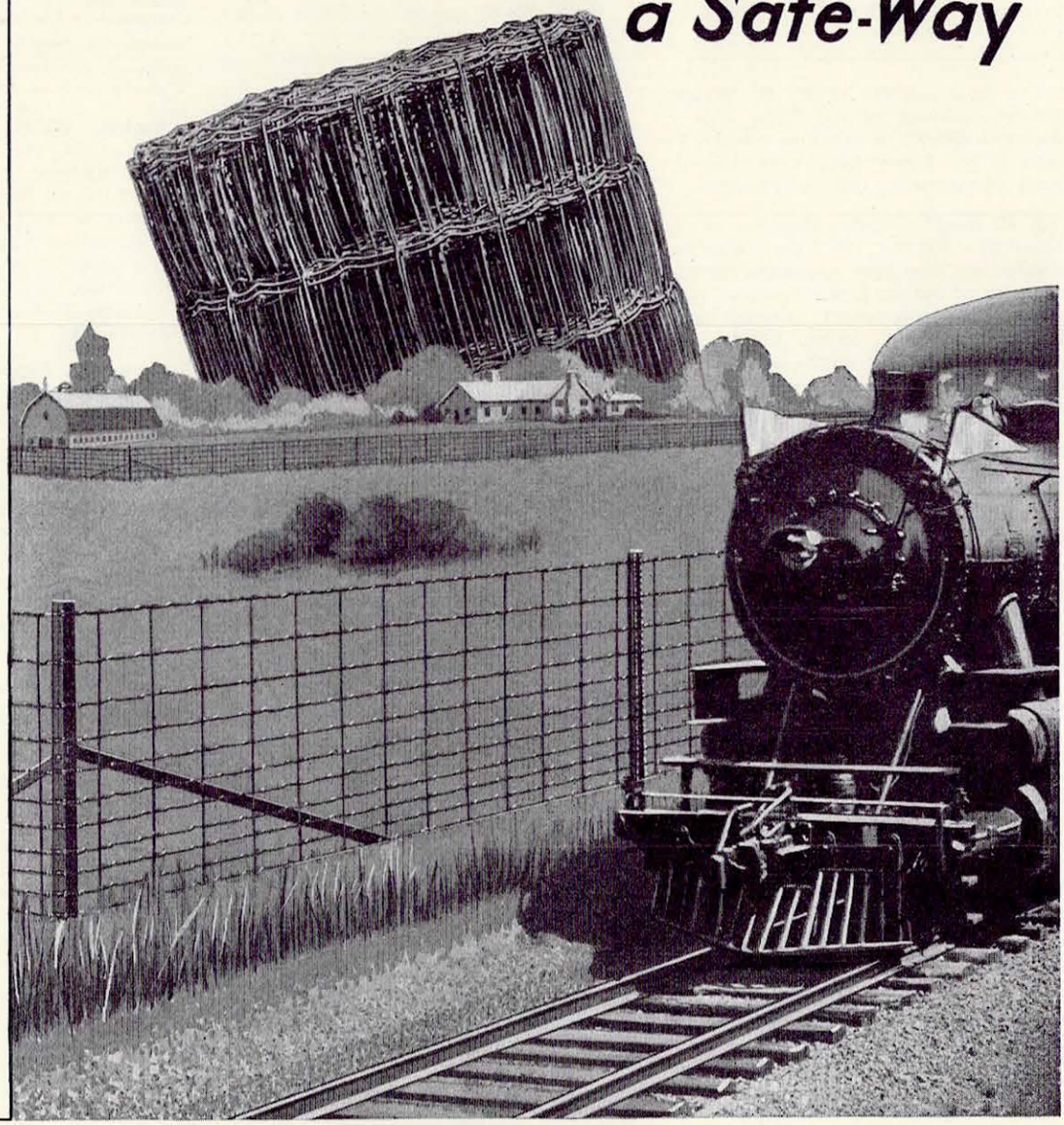
IT is cheaper to put up a good fence than to pay stock claims. Likewise it is economy to buy adequate protection—proved protection—such as that offered by American Railroad Fence and Banner Steel Line Posts—the post of railroad rail construction. These products including National Expanding Anchor End and Corner Posts meet every specification recommended by the American Railway Engineering Association.

Make Your Right-of-Way- - a Safe-Way



1831 COMMEMORATING AMERICAN STEEL & WIRE COMPANY 100 YEARS of PROGRESS IN WIRE MAKING 1931

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208 South La Salle Street, Chicago — SUBSIDIARY OF UNITED STATES STEEL CORPORATION — And All Principal Cities

Pacific Coast Distributors: Columbia Steel Company, Russ Building, San Francisco

Export Distributors: United States Steel Products Company, New York

was then promoted to advertising agent at Omaha, being promoted to general advertising agent at Chicago, in 1915. In 1918, Mr. Cummins was advanced to assistant to the general passenger agent at Omaha and in 1920, to assistant to the passenger traffic manager. His promotion to general passenger agent became effective on January 1.

ENGINEERING AND SIGNALING

F. H. Hibbert, heretofore engineer of the Quebec Central, has been appointed chief engineer with headquarters at Sherbrooke, Que.

M. D. Bowen has been appointed superintendent of work equipment and welding of the Chicago, Milwaukee, St. Paul & Pacific, with headquarters at Chicago.

The headquarters of **C. R. Wright,** district engineer of the Lake Erie & Western district of the New York, Chicago & St. Louis, have been removed from Indianapolis, Ind., to Frankfort.

J. R. Nagel, division engineer of the Missouri division of the Missouri Pacific, has also been appointed division engineer of the St. Louis Terminal division, with headquarters removed from Poplar Bluff, Mo., to St. Louis. The position of division engineer at Poplar Bluff has been abolished. **W. A. Kennon,** division engineer of the St. Louis Terminal division, has been granted a leave of absence because of sickness.

Henry G. Dalton, who has been promoted to engineer of buildings of the Chicago, Burlington & Quincy with headquarters at Chicago, has been connected with that railroad for 26 years. He was born at Aurora, Ill., and now

Henry G. Dalton

resides at Wilmette, Ill. Prior to entering the service of the Burlington in December, 1904, Mr. Dalton served successively as an engineer for the Link Belt Company at Chicago, the Western Electric Company at Chicago, the Gallant-Henning Company at Milwaukee, Wis., and the Fred W. Wolf Company at Chicago. His first experience with the Burlington was in the engineering department. He became assistant engineer of buildings, with headquarters at Chicago, in 1918. Mr. Dalton's promotion as engineer of buildings became effective on December 20, 1930.

Effective January 1, **E. E. Oviatt,** engineer, maintenance of way, of the New York, New Haven & Hartford, was promoted to chief engineer and **A. L. Bartlett,** maintenance engineer was appointed to succeed Mr. Oviatt as engineer, maintenance of way. **W. T. Dorrance,** designing engineer was advanced to assistant to chief engineer.

MECHANICAL

G. S. West, master mechanic of the Philadelphia Terminal division of the Pennsylvania, with headquarters at West Philadelphia, Pa., has been appointed acting superintendent of motive power of the Southwestern division, with headquarters at Indianapolis, Ind.

Francis G. Lister, who has been promoted to assistant general superintendent of motive power of the St. Louis-San Francisco, with headquarters at Springfield, Mo., has been engaged in railway work for nearly 30 years. He was born at Marysville, Kan., on July 8, 1882, and attended the University of Nebraska for two years. He entered railroad service in 1901 as a special apprentice on the Wabash, and in the following year was advanced to mechanical draftsman, a position he held until 1906, when he became a locomotive and car draftsman on the Northern Pacific. In 1911 Mr. Lister was appointed chief draftsman and later mechanical engineer of the Spokane, Portland & Seattle and a number of subsidiaries which are now a part of that railroad, where he remained until 1916 when he became mechanical engineer of the El Paso & Southwestern. When the latter road became a part of the Southern Pacific in 1924 he was appointed master car repairer on that road at El Paso, Tex. Mr. Lister was appointed chief mechanical engineer of the Frisco, with headquarters at Springfield, in 1926, his promotion to assistant general superintendent of motive power becoming effective on January 1.

OBITUARY

C. T. Dabney, formerly division superintendent of the Pennsylvania, died at Richmond, Va., on January 6, at the age of 79 years.

George W. Bradley, freight trainmaster of the Baltimore division of the Pennsylvania, died suddenly December 27, at Baltimore, Md.

Robert N. Burwell, trainmaster on the Indiana Harbor Belt at Gibson, Ind., died at his home at Riverdale, Ill., on January 6.

Charles Albert Draper, formerly purchasing agent of the New York, Ontario & Western, died at his home at Stamford, Conn., on January 6.

J. D. Sweeney, who retired as car accountant of the Panhandle & Santa Fe, with headquarters at Amarillo, Tex., on September 1, died at the Santa Fe hospital at Topeka, Kan., on December 30.

C. H. Miles, who retired as general agent of the passenger department of the Chicago, Milwaukee, St. Paul & Pacific at San Francisco, Cal., in 1926, died at his home in that city on January 2.

Ross C. Cline, special traffic representative of the Wabash at Los Angeles, Cal., died at his home in that city on December 30 at the age of 74 years. Previous to August, 1928, when he assumed the title of special traffic representative at his own request, Mr. Cline served for nearly 30 years as general agent of the freight department of the Wabash at Los Angeles.

Reuben Wells Leonard, who was chairman of the National Transcontinental Railway Commission (Canada) from 1911 to 1914, in charge of construction of that line (now a part of the Canadian National), and prior to that engineer and chief engineer on the construction of a number of short lines in Canada, died at St. Catherines, Ont., December 12.

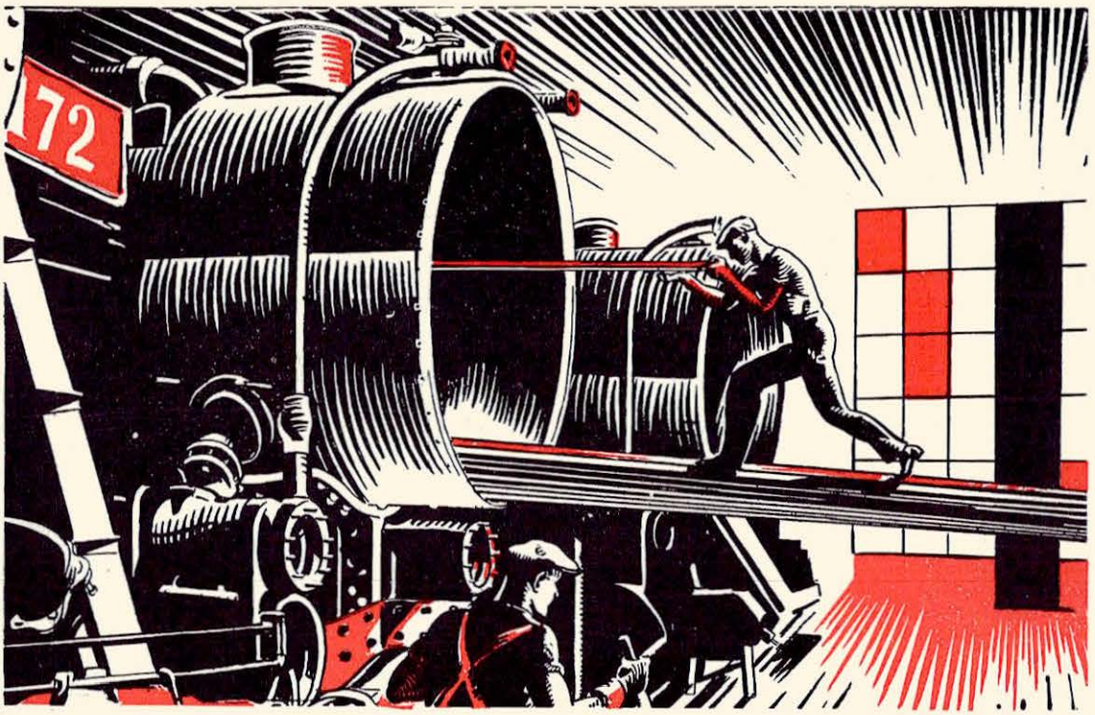
Herbert P. Taussig, former chief engineer of the Terminal Railroad Association of St. Louis and a number of terminal railroads at St. Louis, Mo., which are now a part of that company, died at St. Louis on December 21 at the age of 76 years. Mr. Taussig was chief engineer of the Terminal Association for a number of years prior to 1895, when he resigned to engage in consulting engineering practice. He had charge of the design and construction of the Union station at St. Louis.

James W. Gibbons, general foreman of the passenger car department in the shops of the Atchison, Topeka & Santa Fe at Topeka, Kan., died recently at the Santa Fe hospital in that city at the age of 65 years. Mr. Gibbons was for many years active in the affairs of the Master Car and Locomotive Painters Association of the United States and Canada and was a past chairman of that organization, which is now the Equipment Painting Section of the American Railway Association.

Fountain Rice, former engineer maintenance of way of the National of Mexico, died at his home at Spring Hill, Tenn., on December 19 at the age of 63 years. Mr. Rice entered the service of the National of Mexico as roadmaster at San Luis Potosi, S. L. P., in 1901, after graduating from Central University in Tennessee. In the same year he was promoted to division superintendent at Monterrey, N. L., where he remained until 1910, when he was promoted to engineer maintenance of way, with headquarters at Mexico, D. F. Mr. Rice left railway service in 1911, and had resided in Tennessee since that time.

Continued on Next Left Hand Page

Over twice the service from TONCAN IRON TUBES



■ Every 12 months, a certain western railroad was forced to re-tube the locomotives on a bad water division.

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■ Then they tried tubes of Toncan Iron. After 26 months' service, the Toncan tubes were removed, found to be in excellent condition, and re-applied to a switcher for further service.

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Warren H. Knowlton, former assistant chief engineer of the Chicago Great Western and assistant to the vice president and principal assistant engineer of the New York Central, who retired in 1907 after about 30 years of railway service, died at Denver, Colo., on January 3 at the age of 83 years. Mr. Knowlton entered railway service in 1870 as a rodman on the Iowa Falls & Sioux City and the Cedar Falls & Minnesota (now part of the Illinois Central) in Iowa. Later he served in major engineering positions on railroads which are now part of the Chicago, Milwaukee, St. Paul & Pacific, the Illinois Central, the Great Northern, and the Great Western. Twice during this period he was city engineer of Dubuque, Iowa, for a total of nine years. In 1899, Mr. Knowlton was appointed chief engineer of the Great Western, four years later becoming principal assistant engineer of the New York Central at New York. During his service with latter road, which extended until 1907, he was also assistant to the vice president and chief engineer of the Electric zone at New York. He had made his home in Denver since 1910.

Walt Dennis, superintendent of the New Jersey, Indiana & Illinois, with headquarters at South Bend, Ind., who died at Kansas City on December 6, had been in railway service for more than 30 years. He was born at Alliance, Ohio, in 1879, and graduated from the University of Kansas in 1900. In the same year he obtained his first railroad experience as an axman in the maintenance of way department of the Kansas City Southern. From 1902 to 1917, Mr. Dennis served successively as a bridge draftsman for Waddell & Hedrick, Kansas City, Mo., on location and construction of the Kansas City, Mexico & Orient (now part of the Atchison, Topeka & Santa Fe), chief delineator on construction on the Union Pacific, with Horace G. Burt, consulting engineer, and as construction engineer, special engineer and assistant engineer on special investigation on the Chicago, Rock Island & Pacific. He was then appointed principal assistant engineer of the Wabash at St. Louis, Mo., where he remained until he served during the World war as a major in the construction division of the United States army. Mr. Dennis returned to the Wabash in November, 1918, as division engineer at Moberly, Mo., being promoted to superintendent of the New Jersey, Indiana & Illinois, a subsidiary of the former road, in October, 1921.

Edward C. Carter, former chief engineer of the Chicago & North Western, who died on December 23, at Evanston, Ill., had been in railway service for 40 years. He was born at Waverly, Ill., on January 11, 1854, and obtained his academic education at Rensselaer Polytechnic Institute. He obtained his first railroad experience as a rodman on the Jacksonville South-Eastern (now part of the Chicago, Burlington & Quincy) in 1870, and a year later was employed in the engineering forces of the Cairo & St. Louis (now part of the Mobile & Ohio). Mr. Carter then served successively as a draftsman and mechanical engineer with the Springfield Iron & Steel Company, assistant engineer on the Chicago & Alton, observer on the Mississippi river for the United States

Edward C. Carter

government, assistant engineer of construction on the Indianapolis, Decatur & Springfield (now part of the Baltimore & Ohio), resident engineer and assistant to the chief engineer on the Wabash, St. Louis & Pacific (now the Wabash) and contracting engineer for the Detroit Bridge & Iron Works. In 1887, he was appointed principal assistant engineer of the North Western and two years later he was promoted to chief engineer, with headquarters, as in his previous position, at Chicago. Mr. Carter retired from the latter position on May 31, 1914.

H. E. Allen, superintendent of the Dakota division of the Chicago, Rock Island & Pacific, with headquarters at Estherville, Iowa, who died on December 23, had been in railway service for 44 years. He was born at Hamilton, Mo., on December 14, 1869, and obtained his first experience on the Atchison, Topeka & Santa Fe as a section laborer in 1886. Later he was advanced through the positions of foreman, roadmaster, and superintendent of construction. In 1905, he left the Santa Fe to become general roadmaster on the Fort Worth & Denver City and after a few months was appointed roadmaster on the Rock Island, then being advanced on that road to trainmaster and to assistant superintendent. He was promoted to division superintendent at Amarillo, Tex., in 1907, where he remained until 1911, when he became superintendent of the Trinity & Brazos Valley at Teague, Tex. Three years later he returned to the Rock Island as superintendent of the Dakota division, a position he held continuously until his death.

George H. Campbell, assistant to the president of the Baltimore & Ohio, who died on December 25, at his home in Roland Park, a suburb of Baltimore, Md., as announced in *Railway Age* of January 3, page 132, commenced his railroad career in 1873, as a telegraph student with the Chicago, Burlington & Quincy, at Mendon, Iowa. He filled the following positions consecutively during the next 15 years: Agent and operator with the Burlington at Basco, Ill., 1873 to 1877; chief clerk, Wabash, and westbound agent, Merchants' Dispatch, Quincy, Ill., 1877 to 1881; agent of the Missouri Pacific Lines in Texas, at Laredo, Texas, in charge of Mexican business, 1882 to 1886; commercial freight and passenger agent for the same lines, at Galveston, Tex., 1886 to 1887; and agent, same lines, at San Antonio, Tex., 1887 to 1888. During the next eight years Mr. Campbell was connected with the Big Four, the Chesapeake & Ohio and the Louisville & Nashville, entering the service of the B. & O. in June, 1896, as terminal agent and manager of elevators at Baltimore. In October, 1898, he was appointed inspector of stations and terminals. From June, 1899, to February, 1904, he was assistant general superintendent and then became general superintendent at New York and vice-president of the Staten Island Rapid Transit, Staten Island Railway Company, New York Transit & Terminal Company and the Baltimore & New York Railway Company. Mr. Campbell was assistant to President Willard of the Baltimore & Ohio for 20 years, having been appointed to that position on July 1, 1910.

George H. Campbell

J. F. Gairns, British Railway Writer, Dies

J. F. Gairns, assistant managing editor of the Railway Gazette (London), died suddenly in that city on December 10. Mr. Gairns, who was born on November 18, 1876, was widely known in railway circles of Great Britain, having served as editor of the Railway Magazine and the Railway Year Book in addition to his work on the Gazette. He was also the author of "Locomotive Compounding and Superheating," "Locomotive Superheating," and "Railways for All."

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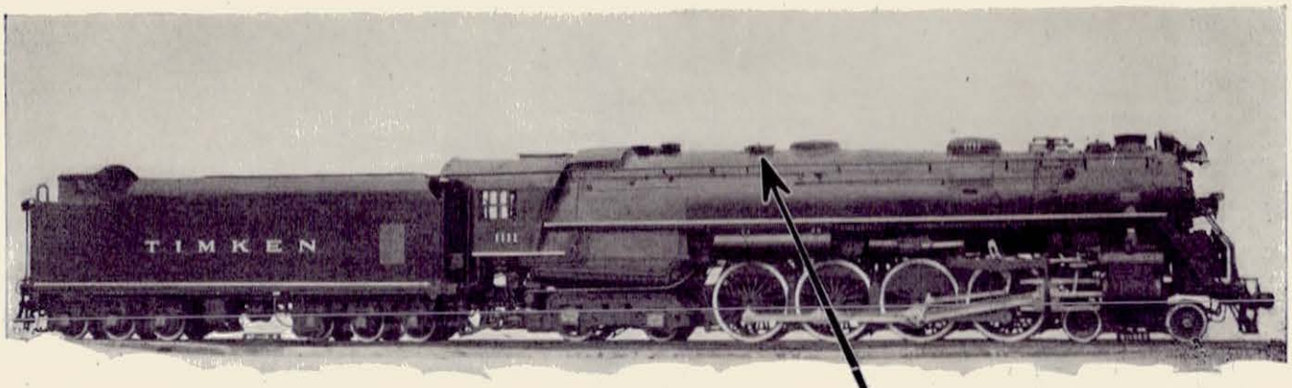

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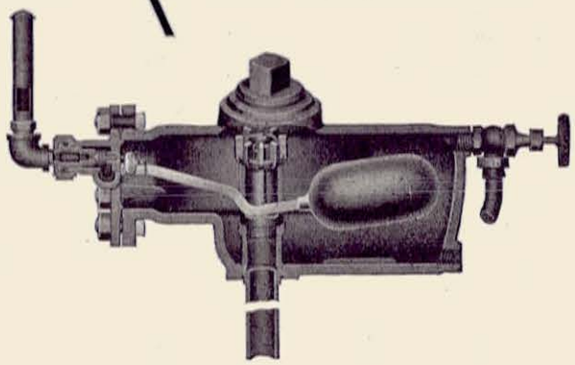

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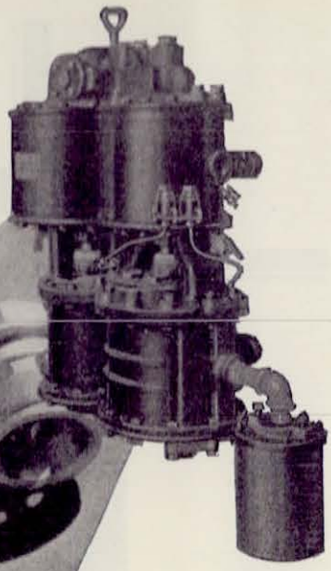

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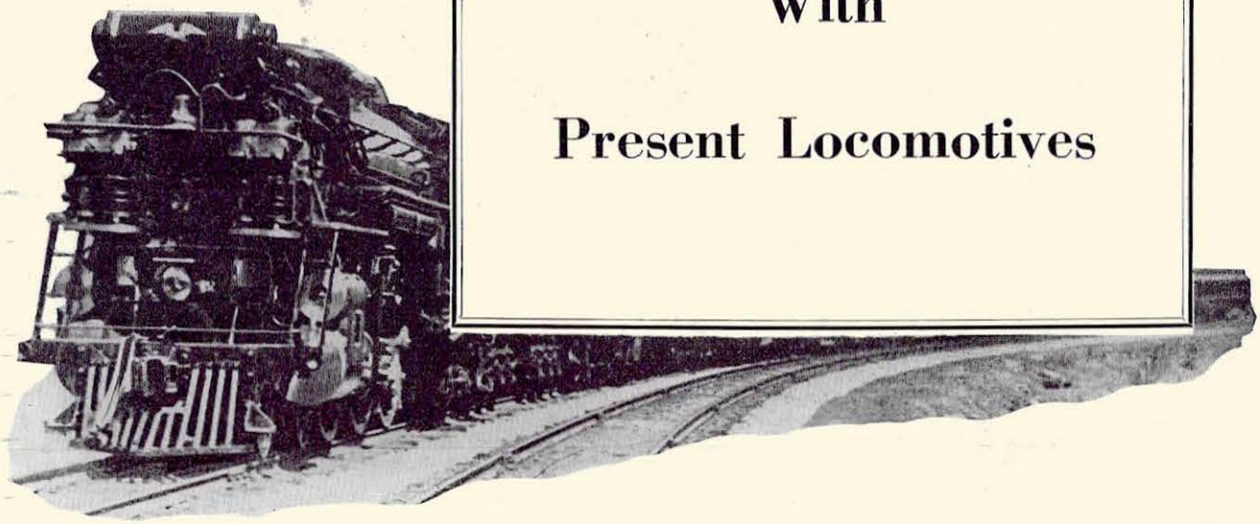
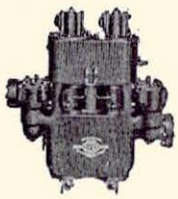
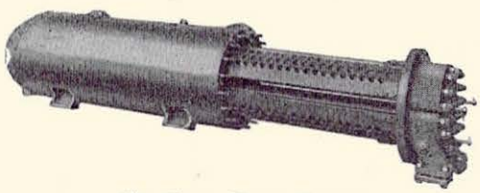




Elesco CF type boiler feed pump



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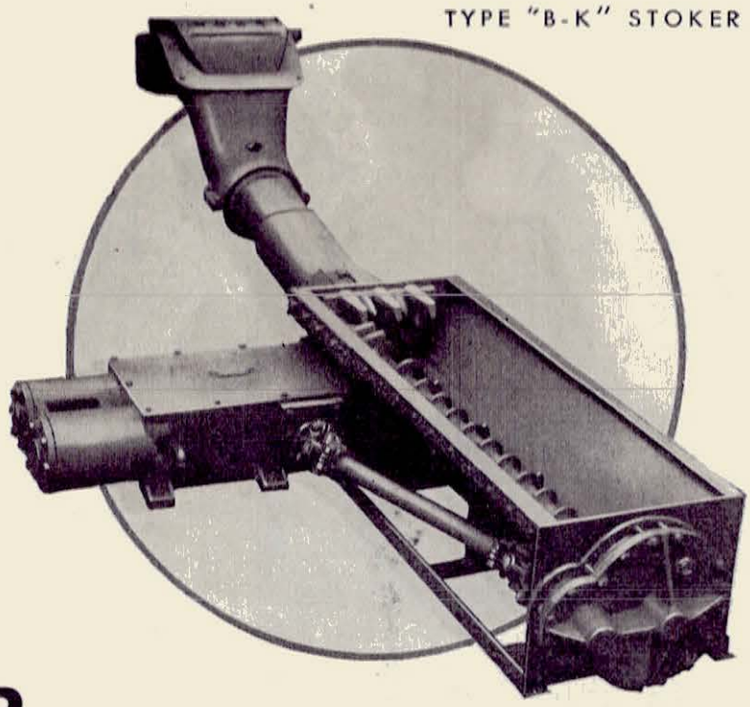
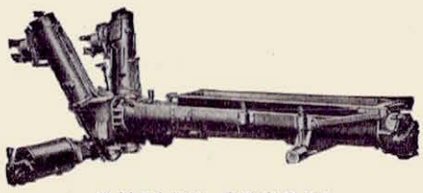
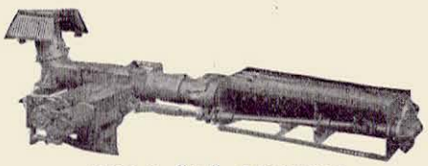


When POWER Is Needed, The Stoker Says "YES"



DUPLEX STOKER



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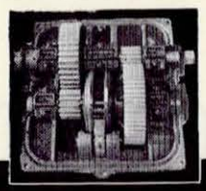

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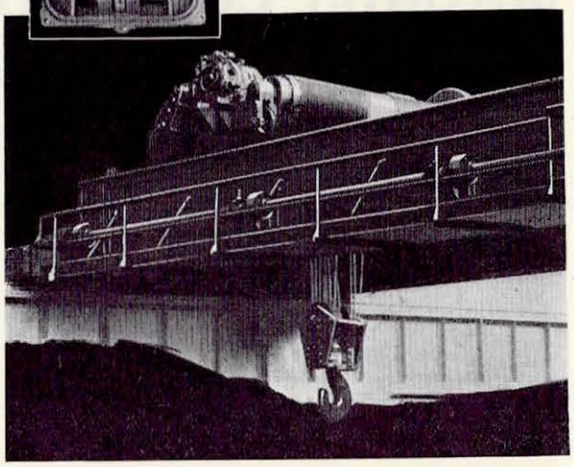

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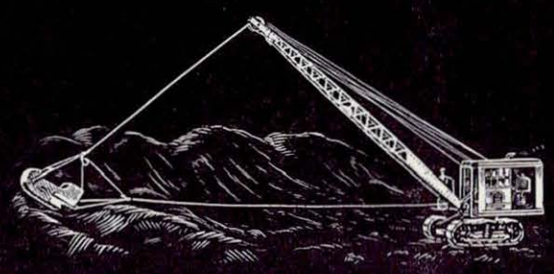

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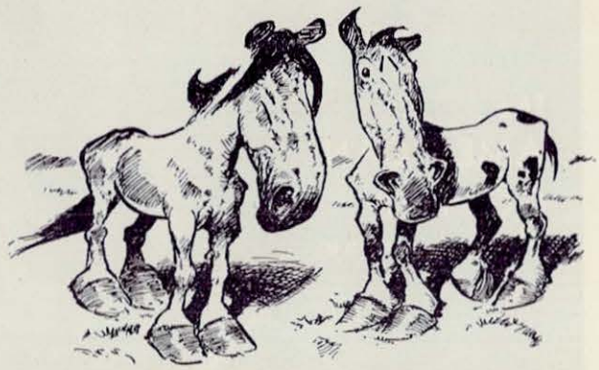

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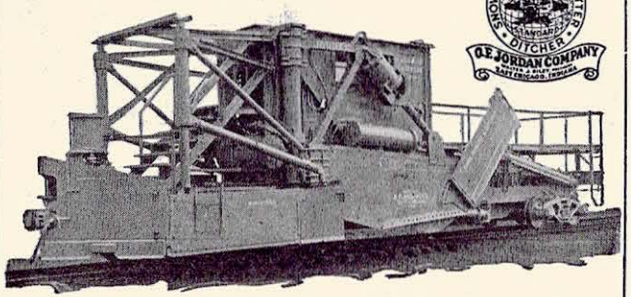

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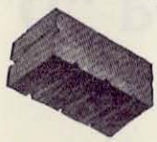

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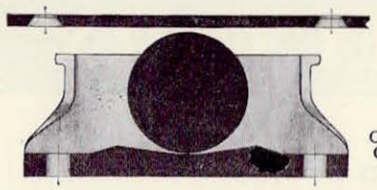

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Timken Roller Bearing Co., The

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Ryerson & Son, Jos. T.

Cleaners, General.
Oakite Products, Inc.

Cleaners, Locomotive.
Oakite Products, Inc.

Cleaners, Metal.
Oakite Products, Inc.

Clips, Wire Rope.
American Hoist & Derrick Co.

Coach and Coach Yard Steam Joints—(See Joints, etc.)

Coaches, Motor.
American Car & Foundry Motors Co.
Dodge Motor Truck Corp.
International Harvester Co.
White Co., The.

Coaches, Second-Hand.
Hyman-Michaels Co.

Coal, Ore & Ash Handling Machinery.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.
Orton Crane & Shovel Co.
Roberts & Schaefer Co.

Coal Pushers.
Standard Stoker Co.

Coaling Stations.
American Bridge Co.
Fairbanks-Morse & Co.
Roberts & Schaefer Co.

Cocks, Angle.
Westinghouse Air Brake Co.

Cocks, Blow-Off.
Bird-Archer Co., The.

Cocks, Cylinder.
Prime Manufacturing Co., The.

Collecting System, Dust.
Whiting Corporation.

Columns, Water.
Prime Manufacturing Co., The.

Combination Crane Pile Drivers.
Industrial Brownhoist Corp.

Compounds, Boiler.
Dearborn Chemical Co.
Bird-Archer Co., The
General Electric Co.

Compounds, Cleaning.
Oakite Products, Inc.

Compounds, Cutting.
Oakite Products, Inc.

Compounds, Grinding.
Oakite Products, Inc.

Compounds, Paint Removing.
Oakite Products, Inc.

Compounds, Rust Proofing.
Oakite Products, Inc.

Compressors, Air.
Ingersoll-Rand Co.
Westinghouse Air Brake Co.
Worthington Pump & Machinery Corp.

Concrete Floor Slabs.
Federal American Cement Tile Co.

Concrete Reinforcement.
American Steel & Wire Co.
Carnegie Steel Co.
Ryerson & Sons, Jos. T.

Concrete Roofing, Tile.
Federal American Cement Tile Co.

Condensers.
Ingersoll-Rand Co.

Condensing Apparatus.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Conduit, Rigid.
Aluminum Co. of America.

Conduits, Metallic Flexible.
Barco Mfg. Co.
Franklin Railway Supply Co., Inc.
Graybar Electric Co.
Vapor Car Heating Co., Inc.

Conduit, Underground.
Graybar Electric Co.
Johns-Manville Corp.

Connections.
Prime Manufacturing Co., The.

Connections, Lever.
National Malleable & Steel Castings Co.

Connections, Truck.
National Malleable & Steel Castings Co.

Connections, Truck Lever.
Schaefer Equipment Co.

Contraction Joint.
General Railway Signal Co.

Control Devices, Train Speed.
Union Switch & Signal Co.

Control, Locomotive.
Valve Pilot Co.

Controllers, Electric.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Conveying Machinery.
American Bridge Co.
Clark Tructractor Co.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.
Orton Crane & Shovel Co.

Corrugated Sheet.
Aluminum Co. of America.

Convevor, Ash — (See Coal Ore and Ash Handling Mach.)

Coupler Pockets—(See Draft Yokes.)

Coupler Yokes.
Bettendorf Co., The.
Gould Coupler Co.
Symington Co., The.

Couplers.
American Steel Foundries.
Buckeye Steel Castings Co.
Franklin Railway Supply Co., Inc.
Gould Coupler Co., The.
McConway & Torley Co.
National Malleable & Steel Castings Co.
Standard Coupler Co.
Westinghouse Air Brake Co.

Couplings, Hose.
Fort Pitt Malleable Iron Co.
Gold Car Heating & Lighting Co.
Ingersoll-Rand Co.
Vapor Car Heating Co., Inc.
Westinghouse Air Brake Co.

Cranes, Ballast Cleaning.
American Hoist & Derrick Co.
Industrial Brownhoist Corp.
Ohio Locomotive Crane Co.

Cranes, Barge.
Industrial Brownhoist Corp.
Ohio Locomotive Crane Co.

Cranes, Bracket.
Shephard-Niles Crane & Hoist Corp.
Whiting Corporation.

Cranes, Crawler.
American Hoist & Derrick Co.
Industrial Brownhoist Corp.
Orton Crane & Shovel Co.

Cranes, Crawling Shovels and Draglines.
American Hoist & Derrick Co.
Industrial Brownhoist Corp.
Orton, Crane & Shovel Co.

Cranes, Diesel.
American Hoist & Derrick Co.
Industrial Brownhoist Corp.
Ohio Locomotive Crane Co.

Cranes, Electric Traveling.
American Hoist & Derrick Co.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.
Whiting Corporation.

Cranes, Gantry.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.
Ohio Locomotive Crane Co.
Orton Crane & Shovel Co.
Shephard-Niles Crane & Hoist Corp.
Whiting Corporation

Cranes, Gasoline.
American Hoist & Derrick Co.
Industrial Brownhoist Corp.
Ohio Locomotive Crane Co.
Orton Crane & Shovel Co.

Cranes, Grab Bucket.
American Hoist & Derrick Co.
Milwaukee Electric Crane & Hoist Corp.

Cranes, Handpower.
American Hoist & Derrick Co.
Shephard-Niles Crane & Hoist Corp.
Whiting Corporation.

Cranes, Jib.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.
Whiting Corporation.
Worthington Pump & Machinery Corp.

Cranes, Locomotive.
American Hoist & Derrick Co.
Industrial Brownhoist Corp.
Ohio Locomotive Crane Co.
Orton Crane & Shovel Co.

Cranes, Magnet.
Whiting Corporation.

Cranes, Overhead.
Milwaukee Electric Crane & Hoist Corp.
Shephard-Niles Crane & Hoist Corp.

Cranes, Pillar.
American Hoist & Derrick Co.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.
Whiting Corporation.

Cranes, Portable.
American Hoist & Derrick Co.
Clark Tructractor Co.

Orton Crane & Shovel Co.
Cranes, Tractor.
Orton Crane & Shovel Co.
Cranes, Transfer.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.
Whiting Corporation.
Cranes, Traveling.
Milwaukee Electric Crane & Hoist Corp.
Shephard-Niles Crane & Hoist Corp.
Cranes, Wharf.
American Hoist & Derrick Co.
Industrial Brownhoist Corp.
Ohio Locomotive Crane Co.
Cranes, Wrecking.
Industrial Brownhoist Corp.
Orton Crane & Shovel Co.
Crank Pins — (See Pins, Cranks).
Creosote.
American Creosoting Co.
Century Wood Preserving Co.
International Creosoting & Constr. Co.
Jennison Wright Co.
Cribbing Units.
Federal American Cement Tile Co.
Cross Arms.
American Bridge Co.
General Electric Supply Corp.
Graybar Electric Co.
International Creosoting & Construction Co.
Cross-Over Bridges, Freight House.
Whiting Corporation.
Cross Ties.
Century Wood Preserving Co.
International Creosoting & Construction Co.
Cross Ties, Creosoted.
American Creosoting Co.
Century Wood Preserving Co.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Cross Ties, Steel.
Bethlehem Steel Co.
Crossheads & Shoes.
Baldwin Locomotive Wks.
Barco Mfg. Co.
International Creosoting & Construction Co.
Crossing Signals & Signs.
Railroad Supply Co.
Crossings — (See Frogs and Crossings).
Crossings, Pavement.
Carey Co., The Philip
Crushers, Coal.
American Sheet & Tin Plate Co.
Orton Crane & Shovel Co.
Culverts.
American Rolling Mill Co., The.
Armco Culvert Mfrs. Assoc.
Republic Steel Corp.
Toncan Culvert Manufacturers' Association.
Culverts Corrugated.
Armco Culvert Manufacturers' Association.
Republic Steel Corp.
Culverts, Paved Invert.
Armco Culvert Mfrs. Assoc.
Cupolas, Foundry.
Whiting Corporation.
Hammett, H. G.
Cups, Oil.
Prime Manufacturing Co., The.
Westinghouse Air Brake Co.
Curtains & Fixtures, Car Window.
Pantasote Co., Inc., The.
Curtain Material, Car.
Ryerson & Son, Jos. T.
Cutting & Welding Apparatus.
Oxweld Railroad Service Co.
Westinghouse Elec. & Mfg. Co.
Cut-Off Indicators & Recorders.
National Tube Co.
Valve Pilot Co.
Cylinder Parts (Finished & Rough).
Locomotive Finished Material Co.
Cylinders, Air Brake.
Westinghouse Air Brake Co.
Cylinders, Cast Steel Locomotive.
General Steel Castings Corp.
Union Steel Casting Co.
Cylinders, Locomotive.
Locomotive Finished Material Co.
Cylinders, Oxy-Acetylene.
Oxweld Railroad Co., The
Deoxidizers.
Q & C Co., The.
Vanadium Corp. of America.
Derricks.
American Hoist & Derrick Co.
Industrial Brownhoist Corp.
Diesel Electric Power Plants
Fairbanks-Morse & Co.
Westinghouse Elec. & Mfg. Co.
Dirt Collectors.
Westinghouse Air Brake Co.
Disinfectants.
West Disinfecting Co.
Dispatching Systems.
General Railway Signal Co.
Union Switch & Signal Co.
Ditchers.
American Hoist & Derrick Co.
Jordan Co., O. F.
Ditching Machinery.
American Hoist & Derrick Co.
Industrial Brownhoist Corp.
Orton Crane & Shovel Co.
Door Fixtures—(See Fixtures Car Door).
Doors, Car.
Camel Sales Co.
Chicago Railway Equipment Co.
Miner, W. H.
Wine Railway Appliance Co.
Doors, Folding, Rolling and Sliding.
Kinnear Manufacturing Co.
Doors, Locomotive Firebox.
Franklin Railway Supply Co., Inc.
Doors, Steel.
Kinnear Manufacturing Co.
Doors, Rolling, Steel.
Kinnear Mfg. Co.
Mahon Co., R. C.
Doors, Wood.
Kinnear Mfg. Co.
Draft Arms.
American Steel Foundries.
Birdsboro Steel Foundry & Mach. Co.
Bradford Corporation.
Symington Co., The.
Universal Draft Gear Attachment Co.
Draft Gear Attachments.
Symington Co., The.
Draft Gears.
American Steel Foundries.
Bradford Corporation.
Cardwell-Westinghouse Co.
Edgewater Steel Co.
Fort Pitt Malleable Iron Co.
Miner, W. H.
National Malleable & Steel Castings Co.
Standard Coupler Co.
Union Draft Gear Co.
Universal Draft Gear Attachment Co.
Draft, Yokes
American Steel Foundries.
Bettendorf Co., The.
Buckeye Steel Castings Co.
Gould Coupler Co., The
McConway & Torley Co.
Miner, W. H.
Mt. Vernon Car Mfg. Co.
National Malleable & Steel Castings Co.
Pressed Steel Car Co.
Steel Car Forge Co.
Symington Co., The
Universal Draft Gear Attachment Corp.
Draglines.
Orton Crane & Shovel Co.
Drainage Gates.
Armco Culvert Mfrs. Assoc.
Republic Steel Corp.
Drains, Perforated Iron.
Armco Culvert Mfrs. Assoc.
Republic Steel Corp.
Drawbar Centering Device.
Gould Coupler Co., The
Miner, W. H.
Drawbars, Unit Safety.
Franklin Railway Supply Co., Inc.
Industrial Brownhoist Corp.
Dredging Machinery.
American Hoist & Derrick Co.
Industrial Brownhoist Corp.
Drilling Machines.
Sellers & Co., Inc., Wm.
Drilling Machines, Bonding.
Railroad Supply Co.
Drilling Machines, Pneumatic.
Ingersoll-Rand Co.
Drilling Machines, Rock.
General Electric Co.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.
Drilling Machines, Upright and Radial.
Ryerson & Son, Joseph T.
Sellers & Co., Inc., Wm.
Drills.
Ingersoll-Rand Co.
Drills, Close Corner.
Ingersoll-Rand Co.
Drills, Concrete.
Ingersoll-Rand Co.
Drills, Steel Rock and Steel Sharpened.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.
Drills, Track & Bending.
Bird-Archer Co., The.
Ingersoll-Rand Co.
Drinking Cups.
U. S. Envelope Co.
Drive Gas Electric Coaches.
General Electric Co.
Drive Gas Electric Locomotives
Westinghouse Elec. & Mfg. Co.
Driving Boxes (Extended Main).
Franklin Railway Supply Co., Inc.
Drop Door Mechanism.
Wine Railway Appliance Co.
Drop Trucks, Transformer.
Whiting Corporation.
Drop Tables, Electric.
Whiting Corporation.
Drop Testing Machinery.
Whiting Corporation.
Drying Ovens.
Mahon Co., R. C.
Dynamos — (See Generators Electric).
Electrical Cable Accessories.
General Cable Corp.
General Electric Supply Corp.
Electric Cables.
General Cable Corp.
General Electric Supply Corp.
Electrical Instruments.
Electric Service Supplies. Co.
Railroad Supply Co.
Westinghouse Elec. & Mfg. Co.
Electrical Supplies.
General Electric Co.
General Electric Supply Corp.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.
Electrification. Railroad.
Battey & Kipp.
General Electric Co.
United Engineers & Constructors, Inc.
Westinghouse Elec. & Mfg. Co.
Electric Heaters.
General Electric Supply Corp.
Electrical Insulation.
General Cable Corp.
General Electric Supply Corp.
Electrical Porcelain Insulators.
General Electric Supply Corp.
Electric Motors.
General Electric Supply Corp.
Electric Rivet Heaters.
General Electric Supply Corp.
Electric Switches.
General Electric Supply Corp.
Enamels.
Sherwin-Williams Co.
End Frames, Cast Steel, Passenger Car
General Steel Castings Corp.
Ends, Steel.
Hutchins Car Rfg. Co.
Union Metal Products Co.
Engineers, Consulting, Civil, Elec., Hydraulic, Mechanical.
Battey & Kipp.
Hunt Co., Robt. W.
Muhlfeld, John E.
United Engineers & Constructors, Inc.
Engineers, Contracting.
Battey & Kipp.
United Engineers & Constructors, Inc.
Engineers and Contractors.
Battey & Kipp.
Hunt Co., Robert W.
Muhlfeld, John E.
United Engineers & Constructors, Inc.
Engineers, Construction.
Battey & Kipp.
Roberts & Schaefer Co.
United Engineers & Constructors, Inc.
Engineers and Contractors. Elec. Hydraulic, Mech.
Battey & Kipp.
Hunt Co., Robert W.
Muhlfeld, John E.
Roberts & Schaefer Co.
Engineers, Inspecting.
Gulick-Henderson Co.
Hunt Co., Robert W.
Muhlfeld, John E.
Pittsburgh Testing Laboratory.
United Engineers & Constructors, Inc.
Engineers, Valuation.
Hunt Co., Robert W.
United Engineers & Constructors, Inc.
Engines, Crude & Fuel Oil.
Fairbanks-Morse & Co.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.
Engines, Diesel.
Worthington Pump & Machinery Corp.
Engines, Gas.
Brill Co., The J. G.
Worthington Pump & Machinery Corp.
Engines, Gas & Gasoline.
American Car & Foundry Motors Co.
Fairbanks-Morse & Co.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.
Engines, Hoisting.
American Hoist & Derrick Co.
Industrial Brownhoist Corp.
Orton Crane & Shovel Co.
Envelopes.
U. S. Envelope Co.
Excavators.
American Hoist & Derrick Co.
Industrial Brownhoist Corp.
Exhaust & Heater Pipe.
Union Asbestos & Rubber Co.
Exhaust & Ventilating Fans.
General Electric Supply Corp.
Expanders, Tube.
Ryerson & Son, Joseph T.
Explosives.
American Steel & Wire Co.
Fans, Exhaust & Ventilating.
General Electric Co.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.
Fasteners, Car Door.
Camel Sales Co.
Fort Pitt Malleable Iron Co.
Miner, W. H.
National Malleable & Steel Castings Co.
Feed Water Heater Systems.
Bird-Archer Co., The.
Coffin, Jr., Co., The J. S.
Worthington Pump & Machinery Corp.
Fence Posts.
International Creosoting & Construction Co.
Fencing Wire — (See Wire Fence).
Fence Posts, Creosoted.
National Lumber & Creosoting Co.
Ferro Alloys.
Vanadium Corp. of America.
Ferro, Chromium.
Vanadium Corp. of America.
Ferro Molybdenum.
Electro Metallurgical Sales Corp.
Vanadium Corp. of America
Ferro Silicon.
Vanadium Corp. of America.
Ferro Tungsten.
Vanadium Corp. of America.
Ferro Vanadium.
Vanadium Corp. of America.
Filters, Air.
Westinghouse Air Brake Co.
Whiting Corporation.
Filters, Dust.
Whiting Corporation.
Filters, Water & Industrial.
Graver Corp.
Filtration Plants, (Water).
Graver Corp.
Fireboxes.
American Locomotive Co.
Baldwin Locomotive Works
Fire Fighting & Protection Equipment.
Johns-Manville Corp.
Fittings, Air Brakes.
Westinghouse Air Brake Co.
Fittings, Steam.
Vapor Car Heating Co., Inc.
Fixtures, Car Door.
Camel Sales Co.
Chicago Railway Equipment Co.
Miner, W. H.
National Malleable & Steel Castings Co.
Flangers, Snow.
Q & C Co., The.
Floodlights.
General Electric Supply Corp.
Graybar Electric Co.
Oxweld Railroad Service Co.
Pyle-National Co.
Symington Co., The.
Westinghouse Elec. & Mfg. Co.
Floodlights, Acetylene.
Oxweld Railroad Service Co., The.
Flooring.
Carey & Co., Philip, The.
Jennison-Wright Co.
Johns-Manville Corp.
Flooring, Car.
Tuco Products Corp.
Flooring, Coach.
Tuco Products Corp.
Flooring, Composition.
Johns-Manville Corp.
Tuco Products Corp.
Flooring, Creosoted.
Central Coal & Coke Co.
Flooring, Wood.
Central Coal & Coke Co.
Century Wood Preserving Co.
Floor Plates, Steel.
Carnegie Steel Co.
Illinois Steel Co.
Floor Slabs, Concrete.
American Cement Tile Mfg. Co.
Flue Cleaners—(See Cleaners, Flue).
Flue Cutters—(See Cutters, Flue).
Flues, Boiler — (See Tubes Boiler).
Flue Shop Equipment.
Ryerson & Son, Joseph T.
Forges, Rivet Heating.
Ryerson & Son, Joseph T.
Forging Hammers.
Industrial Brownhoist Corp.
Forgings.
American Bridge Co.
American Steel Foundries.
Bethlehem Steel Company.

Brill Co., The J. G.
Carnegie Steel Co.
Edgewater Steel Co.
General Railway Signal Co.
Gould Coupler Co., The
Illinois Steel Co.
Midvale Co., The.
Mt. Vernon Car Mfg. Co.
Neely Nut & Bolt Co.
Pressed Steel Car Co.
Standard Steel Works Co.
Steel Car Forge Co.
Universal Draft Gear Attachment Co.

Forgings, Drop.
Brill Co., The J. G.
General Railway Signal Co.
Steel Car Forge Co.
Union Switch & Signal Co.

Forgings, Monel Metal.
International Nickel Co., The.

Foundry Equipment.
Whiting Corporation.

Foundry Supplies.
Bird-Archer Co., The

Frames, Cast Steel, Locomotive
General Steel Castings Corp.

Frames, Locomotive.
American Steel Foundries.
American Locomotive Co.
Baldwin Locomotive Works
Birdsboro Steel Foundry & Mach. Co.
Ohio Steel Foundry Co., The.
Union Steel Casting Co.

Frames, Truck.
American Locomotive Co.
American Steel Foundries.
Baldwin Locomotive Works
Bettendorf Co., The.
Birdsboro Steel Foundry & Mach. Co.
Buckeye Steel Castings Co.
Brill Co., The J. G.
Franklin Railway Supply Co., Inc.
Gould Coupler Co., The.
Ohio Steel Foundry Co., The.
Pressed Steel Car Co.
Pyle-National Co.
Symington Co., The

Frames, Vanadium.
American Locomotive Co.
Baldwin Locomotive Works
Birdsboro Steel Foundry & Mach. Co.
Union Steel Casting Co.

Frogs and Crossings.
Bethlehem Steel Company.
Continuous Rail Crossing Corp.
Ramapo Ajax Corp.

Fulcrums, Brake Beam.
American Steel Foundries.
Brill Co., The J. G.
Chicago Railway Equipment Co.
National Malleable & Steel Castings Co.

Furnaces, Electric.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Furnaces, Gasoline.
Railroad Supply Co.
Whiting Corporation.

Furnaces, Rivet Heating — (See Forges, Rivet Heating).

Furniture.
Aluminum Co. of America.

Gage Testers—(See Testers Gage).

Gages, Air.
Westinghouse Air Brake Co.

Gages, Oxy-Acetylene.
Oxweld Railroad Service Co., The.

Gages, Steam.
Ashton Valve Co.

Gages, Tire.
Schrader's Son, Inc., A.

Gages, Wheel Press Recording.
Ashton Valve Co.

Gaskets.
Westinghouse Air Brake Co.

Gasoline.
Ethyl Gasoline Corp.

Gear Blanks, Rolled Steel.
Edgewater Steel Co.
Standard Steel Works Co.

Gears and Pinions.
American Steel Foundries.
Westinghouse Elec. & Mfg. Co.

Gears, Silent.
General Electric Co.
Westinghouse Elec. & Mfg Co.

Gears, Valve — (See Valve Gears).

Generators, Acetylene.
Oxweld Railroad Service Co.

Generators, Car Lighting.
Safety Car Heating & Lighting Co.

Generators, Electric.
Fairbanks-Morse & Co.
General Electric Co.
Graybar Electric Co.
Sunbeam Electric Mfg. Co.
Westinghouse Elec. & Mfg. Co.

Goggles, Welding.
Oxweld Railroad Service Co., The.
Sunbeam Electric Mfg. Co.

Graders, Elevating.
Western Wheeled Scraper Co.

Graphite Penetrating Oil.
Alemite Mfg. Corp.

Grapples, Wood.
Industrial Brownhoist Corp.

Grate Bars.
Q & C Co., The.

Grate Shakers, Automatic.
Franklin Railway Supply Co., Inc.

Grates.
Firebar Corp.

Greases.
Alemite Mfg. Corp.

Grease Forming Machines.
Franklin Railway Supply Co., Inc.

Grey Iron.
American Brake Shoe & Foundry Co.

Grinding Machines.
Sellers & Co., Inc., Wm.

Grinding Machines, Portable.
Ingersoll-Rand Co.

Guard Rails, Creosoted Wood
International Creosoting & Construction Co.

Guard Rails, Foot Guard.
Q & C Co., The.

Guard Rails (One Piece).
Bethlehem Steel Company.
Ramapo Ajax Corp.

Guard Switch Point.
Q & C Co., The.

Guards, Cattle.
American Bridge Co.

Guards, Dust.
Gould Coupler Co., The
Symington Co., The.

Hair Felt.
Johns-Manville Corp.

Hammers, Pneumatic.
Ingersoll-Rand Co.

Hammers, Riveting.
Ingersoll-Rand Co.

Hammers, Steam.
Industrial Brownhoist Corp.
Sellers & Co., Inc., Wm.

Hand Brakes—(See Brakes, Hand).

Hangers, Ball Bearing.
S. K. F. Industries, Inc.

Hand Rails & Fittings.
Aluminum Co. of America.

Hangers, Bottom Rod Safety.
Chicago Railway Equipment Co.

Hangers, Car Door — (See Fixtures, Car Door).

Headlight Repair Parts, Electric.
Electric Service Supplies Co.
Pyle-National Co.
Sunbeam Electric Mfg. Co.

Headlights, Electric.
General Electric Co.
Sunbeam Electric Mfg. Co
Westinghouse Electric & Mfg. Co.

Headlights, Reflectors & Cases.
Pyle-National Co.
Sunbeam Electric Mfg. Co.

Heaters, Electric.
Gold Car Heating & Lighting Co.
Westinghouse Electric & Mfg. Co.

Heaters, Electric Rivet.
American Hoist & Derrick Co.

Heaters, Feedwater.
Graver Corp.

Heaters, Feedwater Locomotive.
Coffin Co., Jr., The J. S.
Superheater Company, The.
Worthington Pump & Machinery Corp.

Heaters, Feed Water, Stationary.
Brill Co., The J. G.
Worthington Pump & Machinery Corp.

Heating & Ventilating Apparatus.
Gold Car Heating & Lighting Co.
Vapor Car Heating Co., Inc.
Westinghouse, Electric & Mfg. Co.

Heating Equipment, Car
Gold Car Heating & Lighting Co.
Safety Car Htg. & Ltg Co.
Vapor Car Heating Co., Inc.
Wine Railway Appliance Co.

Heating Systems, Car (Electric and Steam).
Gold Car Heating & Lighting Co.
Safety Car Htg. & Ltg. Co.
Vapor Car Heating Co., Inc.
Wine Railway Appliance Co.

High Temperature Cements.
Carey & Co., Philip, The.

Highway Crossing Protection Devices.
American Bridge Co.
Franklin Railway Supply Co., Inc.
Railroad Supply Co.

Hoists, Air.
Whiting Corporation.

Hoists, Locomotive.
Whiting Corporation.

Hoists, Car, Coach.
Whiting Corporation.

Hoists, Chain.
Milwaukee Electric Crane & Hoist Corp.
Ryerson & Son, Jos. T.

Hoists, Electric.
American Hoist & Derrick Co.
Milwaukee Electric Crane & Hoist Corp.

Hoists, Pneumatic.
Ingersoll-Rand Co.

Hoists, Portable Car.
Whiting Corporation.

Hoists, Second-Hand.
Hyman-Michaels Co.

Hoisting Machinery.
American Hoist & Derrick Co.
Industrial Brownhoist Corp.
Orton Crane & Shovel Co.
Milwaukee Electric Crane & Hoist Corp.

Hooks, Wrecking.
National Malleable & Steel Castings Co.

Horns, Pneuphonic.
Westinghouse Air Brake Co.

Hose, Air, Steam, Etc.
Ingersoll-Rand Co.
Westinghouse Air Brake Co.
Worthington Pump & Machinery Corp.

Hose, Oxy-Acetylene.
Oxweld Railroad Service Co., The.

Hose, Tender.
Prime Manufacturing Co., The.
Westinghouse Air Brake Co.

Ice Cutters.
Jordan Co., O. F.

Incandescent Lamps.
General Electric Supply Corp.

Indicators, Speed & Cut-off.
Valve Pilot Co.

Ingots.
Birdsboro Steel Foundry & Mach. Co.
Carnegie Steel Co.
Edgewater Steel Co.
Illinois Steel Co.
Interstate Iron & Steel Co.
McConway & Torley Co.
Standard Steel Works Co.

Injectors, Exhaust Steam.
Sellers & Co., Inc., Wm.
Superheater Co., The.

Inspection of Material and Equipment—(See Engineers, Inspection).

Insulated Wire.
General Cable Corp.
General Electric Supply Corp

Insulation, Car.
Carey Co., Philip, The.
Lehon Co., The.

Insulation Car Bldg.
Carey Co., Philip, The.
Johns-Manville Corp.
Tuco Products Corp.
Union Asbestos & Rubber Co

Insulation, Electrical.
General Cable Corp.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Insulation, Exhaust & Heater Pipe.
Carey Co., Philip, The.
Johns-Manville Corp.
Tuco Products Corp.
Union Asbestos & Rubber Co.

Insulation, Heat.
Carey Co., Philip, The.
Miner, W. H.

Insulation Tape.
General Electric Supply Corp.

Insulators, Electrical, Porcelain.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.

Interlocking Plant Equipment.
General Railway Signal Co.
Union Switch & Signal Co.

Iron Chain.
Falls Hollow Staybolt Co.
Lockhart Iron & Steel Co.

Iron, Charcoal.
Bethlehem Steel Co.
Ewald Iron Co.
Falls Hollow Staybolt Co.
Lockhart Iron & Steel Co.

Iron, Engine Bolt.
Lockhart Iron & Steel Co.

Iron, Forging Billets.
Lockhart Iron & Steel Co.

Iron, Hollow Staybolt.
Falls Hollow Staybolt Co.
Ryerson & Son, Joseph T.

Iron, Hollow Staybolt Bars.
Bethlehem Steel Co.
Falls Hollow Staybolt Co.
Ryerson & Son, Joseph T.

Iron, Pig.
Bethlehem Steel Co.

Iron, Refined.
Ewald Iron Co.
Falls Hollow Staybolt Co.
Lockhart Iron & Steel Co.
Reading Iron Co.
Ryerson & Son, Joseph T.

Iron, Staybolt — (See also Staybolts).
Ewald Iron Co.
Falls Hollow Staybolt Co.
Interstate Iron & Steel Co.
Lockhart Iron & Steel Co
Reading Iron Co.
Ryerson & Son, Jos. T.

Jacking, Locomotive
Carey Co., Philip, The.

Jacks, Smoke.
Carey Co., Philip, The.
Johns-Manville Corp.

Jacks, Screw Electric—Locomotive & Car Lighting.
Whiting Corporation.

Joints, Air Reservoir.
Barco Mfg. Co.
Franklin Railway Supply Co., Inc.

Joints, Blow Off Line (Roundhouse).
Barco Mfg. Co.
Franklin Railway Supply Co., Inc.

Joints, Coach and Coach Yard.
Barco Mfg. Co.
Franklin Railway Supply Co., Inc.

Joints, Flexible.
Franklin Railway Supply Co., Inc.
Vapor Car Heating Co., Inc.

Joints, Flexible Ball.
Barco Mfg. Co.

Joints, Rail.
American Steel Foundries.
Carnegie Steel Co.
Illinois Steel Co.
Q & C Co., The.
Rail Joint Co.
Union Switch & Signal Co.

Joints, Steam, Air & Liquid.
Barco Mfg. Co.
Franklin Railway Supply Co., Inc.
Vapor Car Heating Co., Inc.

Joints, Swing.
Barco Mfg. Co.
Vapor Car Heating Co., Inc.

Journal Boxes and Lids.
Allegheny Steel Co.
American Steel Foundries.
Brill Co., The J. G.
Gould Coupler Co., The.
Hunt-Spiller Mfg. Corp.
National Malleable & Steel Castings Co.
Pullman Car & Mfg. Corp.
Railway Steel Spring Co.
Symington Co., The.
Union Spring & Mfg. Co.

Journal Oilers, Car & Locomotive.
Ardco Mfg. Co.

Keys, Brake Shoe.
Bradford Corporation.
Mt. Vernon Car Mfg. Co.
Steel Car Forge Co.
Union Spring & Mfg. Co

Knuckles Emergency.
Q & C Co., The.

Laboratories, Testing.
Hunt Co., Robert W.
Pittsburgh Testing Laboratory.

Lacquers.
General Electric Supply Corp.
Sherwin-Williams Co.

Ladders, Steel Car.
Wine Railway Appliance Co.

Lagging, Locomotive.
Carey & Co., Philip, The.
Johns-Manville Corp.

Lamps, Incandescent.
General Electric Co.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.

Lamps, Inspector's.
Oxweld Railroad Service Co., The.

Lath, Metal.
American Rolling Mill Co., The.
Truscon Steel Co.

Lathes, Axle.
Sellers & Co., Inc., Wm

Lathes, Engine.
Ryerson & Son, Joseph T.

Lathes, Wheel.
Sellers & Co., Inc., Wm

Lead, White.
National Lead Co.

Lighting Equipment, Car.
Electric Storage Battery Co.
Safety Car Htg. & Ltg. Co.

Lighting Fixtures and Systems.
General Electric Supply Corp.
Graybar Electric Co.
Pyle-National Co.
Safety Car Htg. & Ltg. Co.

Lighting Plants, Gas, Electric
Sunbeam Electric Mfg. Co.

Lightning Arresters.
General Electric Supply Corp.

Line Material.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.

Lock Nuts—(See Nut Locks).

Locomotive Water Conditioners.
Bird-Archer Co., The.

Locomotives, Contractors.
American Locomotive Co.
Baldwin Locomotive Works.
Lima Locomotive Works.

Locomotives, Electric.
American Locomotive Co.
Baldwin Locomotive Works.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Locomotives, Gasoline.
Baldwin Locomotive Works.

Locomotives, Gas-Electric.
Electro Motive Co.

Locomotives, Geared.
Lima Locomotive Works.

Locomotives, Industrial.
American Locomotive Co.
Baldwin Locomotive Works.
General Electric Co.
Lima Locomotive Works.
Westinghouse Elec. & Mfg. Co.

Locomotives, Mine.
American Locomotive Co.
Baldwin Locomotive Works.
General Electric Co.
Lima Locomotive Works.
Westinghouse Elec. & Mfg. Co.

Locomotives, Oil, Engine, Electric Driven.
American Locomotive Co.
Baldwin Locomotive Works.
General Electric Co.
Ingersoll-Rand Co.
Westinghouse Elec. & Mfg. Co.

Locomotives, Rebuilt.
American Locomotive Co.

Locomotives, Repair Parts.
American Locomotive Co.
Baldwin Locomotive Works.
Lima Locomotive Works.

Locomotives, Second-Hand.
Hyman-Michaels Co.

Locomotives, Steam.
American Locomotive Co.
Baldwin Locomotive Works.
Lima Locomotive Works.

Locomotive Stokers.
Standard Stoker Co.

Locomotive Valve Pilot.
Valve Pilot Co.

Lubricants.
Alemite Mfg. Corp.

Lubrication Equipment.
Alemite Mfg. Corp.

Lubrication Systems.
Alemite Mfg. Corp.

Lubricators, Driving Box.
Franklin Railway Supply Co., Inc.

Lubricators, Piston Rod.
Q & C Co., The.

Lumber.
Central Coal & Coke Co.
Curtin-Howe Corp.
West Coast Lumber Trade Extension Bureau.

Lumber, Asbestos.
Carey & Co., Philip, The.
Johns-Manville Corp.

Lumber, Creosote Treated.
International Creosoting & Construction Co.

Lumber, Creosoted.
American Creosoting Co.
Central Coal & Coke Co.
Century Wood Preserving Co.
Industrial Lumber & Creosoting Co.
International Creosoting & Construction Co.
Jennison-Wright Co.
National Lumber & Creosoting Co.

Machinery, Hydraulic.
Birdsboro Steel Foundry & Mach. Co.

Machine Screws, Monel Metal
International Nickel Co., The.

Magnets, Lifting.
Industrial Brownhoist Corp.
Electro Metallurgical Sales Corp.

Mechanical Draft Apparatus—(See Heating and Vent. App.)

Mechanical Stokers.
Standard Stoker Co.

Melters, Snow, Electric.
Q & C Co., The.

Metallic Flexible Conduit.
General Electric Supply Corp.

Meters, Water & Oil.
Worthington Pump & Machinery Corp.

Milling Machines, Planer Type.
Sellers & Co., Inc., Wm.

Milling Machines, Plain and Universal.
Ryerson & Son, Joseph T.

Mohair Upholstery Velvets.
Chase & Co., L. C.
Massachusetts Mohair Plush Co.

Molybdenum Metal.
Vanadium Corp. of America.

Monel Metal, Rods, Sheets, Tubes, Wire, etc.
International Nickel Co., The.

Motors, Electric.
Fairbanks-Morse & Co.
General Electric Co.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.

Motors & Generators.
Fairbanks-Morse & Co.

Moulding.
Aluminum Co. of America.

Movers, Locomotive.
Whiting Corporation.

Multiple V Belt Drives
Worthington Pump and chinery Corp.

Nails.
American Steel & Wire Co.
Reading Iron Co.
Ryerson & Son, Joseph T.

Nipples, Air Hose.
Prime Manufacturing Co.

Nozzles, Exhaust.
Franklin Railway Supply Co., Inc.

Nozzles, Oxy-Acetylene Cutting.
Oxweld Railroad Service Co., The.

Nuts—(See Bolts and Nuts).

Nut Locks.
Dardelet Threadlock Corp.
Grip Nut Co.
Reliance Mfg. Co.

Nuts, Tank Hose.
Prime Manufacturing Co., The.

Office Appliances.
Remington-Rand Business Service

Oil-Electric Locomotives.
American Locomotive Co.
General Electric Co.
Ingersoll-Rand Co.
Westinghouse Elec. & Mfg. Co.

Oil Filtering & Storage Systems.
Graver Corp.

Oil, Linseed.
National Lead Co.

Oil Plugs, Steam Chest.
Franklin Railway Supply Co., Inc.

Oxy-Acetylene Apparatus.
Oxweld Railroad Service Co., The.

Oxygen.
Oxweld Railroad Service Co., The.

Packing, Air Pump.
Johns-Manville Corp.
Pilot Packing Co.
Union Asbestos & Rubber Co.
Westinghouse Air Brake Co.

Packing, Cylinder and Valve Ring.
Hunt-Spiller Mfg. Corp.
Westinghouse Air Brake Co.

Jacking, Locomotive.
Johns-Manville Corp.

Packing, Locomotive Cab Cock.
Johns-Manville Corp.
Union Asbestos & Rubber Co.

Packing, Ring Boiler.
Union Asbestos & Rubber Co.

Packing, Semi-Metallic.
Pilot Packing Co.
Central Alloy Steel Corp

Packing, Sheet.
Johns-Manville Corp.
Union Asbestos & Rubber Co.

Packing, Soft.
Carey & Co., Philip, The.
Johns-Manville Corp.
Pilot Packing Co.
Union Asbestos & Rubber Co.

Packing, Throttle.
Johns-Manville Corp
Union Asbestos & Rubber Co.

Packing.
Westinghouse Air Brake Co

Packing, Cylinder & Valve Ring.
Locomotive Finished Material Co.

Paint Burners, Acetylene.
Oxweld Railroad Service Co., The.

Paint, Metal Protective.
National Lead Co.
Sherwin-Williams Co

Paint, Powder.
Aluminum Co. of America.

Paints.
Lehon Co., The.
National Lead Co.
Sherwin-Williams Co.

Paper, Carbon.
Remington-Rand Business Service

Paper, Sheathing.
Carey & Co., Philip, The.
Lehon Co., The.

Pavement Breakers.
Ingersoll-Rand Co.

Pickling Equipment, Monel Metal.
International Nickel Co., The.

Pile Drivers.
American Hoist & Derrick Co.
Industrial Brownhoist Co.

Piling, Creosoted.
American Creosoting Co.
Century Wood Preserving Co.
International Creosoting & Construction Co.
Jennison-Wright Co.
National Lumber & Creosoting Co.

Piling, Sheet Steel.
American Bridge Co.
Carnegie Steel Co.

Pilot Beams, Cast Steel.
General Steel Castings Corp.
Gould Coupler Co., The

Pilots, Cast Steel.
General Steel Castings Corp.
Locomotive Finished Material Co.

Pins, Airbrake.
Steel Car Forge Company.

Pins, Center.
Miner, W. H.

Pins, Coupler Knuckle.
McConway & Torley Co.
National Malleable & Steel Castings Co.

Pins, Crank.
American Locomotive Co
Baldwin Locomotive Works
Miner, Inc., W. H.
Standard Steel Works Co
Union Asbestos & Rubber Corp.

Pipe Coverings.
Carey & Co., Philip, The.
Johns-Manville Corp.

Pipe Fittings—(See Fittings. Pipe).

Pipe, Metal Culvert.
American Rolling Mill Co
American Sheet & Tin Plate Co.
Republic Steel Corp.

Pipe, Steel Signal.
National Tube Co.

Pipe, Wrought Iron.
Byers Co., A. M.
Reading Iron Co.

Pits, Drop Pit Tables.
Whiting Corporation.

Planers, Plate.
Ryerson & Son, Jos. T.
Sellers & Co., Inc., Wm.

Plates.
Steel Car Forge Co.

Plates, Follower.
Steel Car Forge Co.

Plates, Boiler, Firebox—(See Steel Firebox).

Plates, Center—(See Bearings, Center).

Plates, Iron & Steel.
American Rolling Mill Co., The.
Carnegie Steel Co.
Illinois Steel Co.
Inland Steel Co.
Interstate Iron & Steel Co.
Ryerson & Son, Joseph T.

Plates, Tie.
Illinois Steel Co.
Inland Steel Company.
Interstate Iron & Steel Co
Railroad Supply Co.
Tennessee Coal, Iron & Railroad Co.

Plates, Tin and Terne.
American Sheet & Tin Plate Co.

Platforms, Car.
Gould Coupler Co., The
Standard Coupler Co.

Platforms, Cast Steel, Passenger Car
General Steel Castings Corp.

Plows, Railroad and Grading.
Western Wheeled Scraper Co.

Plows, Snow.
American Locomotive Co.
Brill Co., The J. G.
Clark Tructractor Co.
Jordan Co., O. F.
Q & C Co., The.

Plugs, Arch Tube.
Prime Mfg. Co., The.

Plugs, Oil & Grease Cup.
Prime Mfg. Co., The.

Plugs, Washout.
Prime Mfg. Co., The.

Plush, Mohair.
Chase & Co., L. C.
Massachusetts Mohair Plush Co.

Pneumatic Tools.
Ingersoll-Rand Co.

Poles.
Central Coal & Coke Co.
General Electric Supply Corp.
Graybar Electric Co.

Poles, Creosoted.
American Creosoting Co.
Central Coal & Coke Co.
Century Wood Preserving Co.
Graybar Electric Co.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.

Poles, Signal.
General Railway Signal Co.
International Creosoting & Construction Co.
Union Switch & Signal Co.
Whiting Corporation.

Poles, Steel Tubular.
Graybar Electric Co.
National Tube Co.

Poles, Zinc Metal Arsenite Treatment.
Curtin-Howe Corp.

Posts, Fence.
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.

Posts, Fence, Creosoted.
Inland Steel Co.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.

Posts, Steel Fence.
American Steel & Wire Co
Q & C Co., The.

Powder, Blasting—(See Explosives).

Powdered Coal Equipment.
Muhlfeld, John E.

ower Transmission Supplies
Sellers & Co., Inc., Wm

Power Plants.
General Electric Co.
Muhlfeld, John E.
United Engineers & Constructors, Inc.
Westinghouse Elec. & Mfg Co.

Power Shovels.
American Hoist & Derrick Co.
Northwest Engineering Co

Power Transmission Supplies
Sellers & Co., Inc., Wm.
Wrought Iron Co. of America.

Preservatives, Wood.
Century Wood Preserving Co
Jennison-Wright Co.

Presses, Flanging Hydraulic
Birdsboro Steel Foundry & Mach. Co.

Presses, Hydraulic.
Birdsboro Steel Foundry & Mach Co.

Presses, Wheel.
Birdsboro Steel Foundry & Mach Co.
Sellers & Co., Inc., Wm

Pulverizers, Coal — (See Crushers, Coal).

Pullers, Car Electric.
Whiting Corporation.

Pullshovels.
American Hoist & Derrick Co.
Whiting Corporation.

Pulverized Coal Burning Systems.
Whiting Corporation.

Pumping Stations.
Fairbanks-Morse & Co.

Pump Liners, Monel Metal.
International Nickel Co., The.

Pump Rods, Monel Metal.
International Nickel Co., The.

Pump Shafts, Monel Metal.
International Nickel Co., The.

Pumps, Hydraulic.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Pumps & Pumping Machinery.
Fairbanks-Morse & Co.
Ingersoll-Rand Co.
Westinghouse Air Brake Co.
Worthington Pump & Machinery Corp.

Pumps, Vacuum.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Punching and Shearing Machines.
Ryerson & Son, Joseph T.

Pushers, Coal.
Standard Stoker Co.

Pyrometers, Superheated Steam.
Superheater Co., The.

Rail Anchors.
Bethlehem Steel Co.
P. & M. Co., The.

Rail-Bonds.
American Steel & Wire Co.
General Cable Corp.
General Electric Co.
General Railway Signal Co.
Graybar Electric Co.
Railroad Supply Co.
Union Switch & Signal Co
Westinghouse Elec. & Mfg Co.

Rail Braces — (See Braces, Rail).

Rail Cranes.
American Hoist & Derrick Co.

Rail Reclamation Equipment.
Ryerson & Son, Joseph T.

Railroad Shops.
United Engineers & Constructors, Inc.

Rail Splice Plates — (See Joints, Rail).

Railroad Structures — (See Engineers and Contractors; also Building).

Rails.
Bethlehem Steel Co.
Carnegie Steel Co.
Hyman-Michaels Co.
Illinois Steel Co.
Inland Steel Co.
Tennessee Coal, Iron & Railroad Co.
Thomson Rail Corp.

Rails, Relaying.
Hyman-Michaels Co.

Railway Signals.
General Electric Supply Corp.

Rattan.
Hale-Kilburn Co.
Heywood-Wakefield Co.

Receivers, Air.
Ingersoll-Rand Co.
Westinghouse Air Brake Co.

Recorders, Speed & Cut-off.
Valve Pilot Co.

Rectifiers for Signal Work.
General Electric Co.
Railroad Supply Co.
Union Switch & Signal Co.

Reducing Valves.
Vapor Car Heating Co., Inc.

Reflectors, Headlight.
Sunbeam Electric Mfg. Co.

Refrigerators.
American Radiator Co
Wine Railway Appliance Co.

Regulators, Oxy-Acetylene.
Oxweld Railroad Service Co., The.

Relays.
General Railway Signal Co.
Railroad Supply Co.
Union Switch & Signal Co.
Westinghouse Elec. & Mfg. Co.

Removers, Paint & Varnish.
Oakite Products, Inc.

Repair Parts, Stoker.
Standard Stoker Co.
Q & C Company, The.

Retorts Creosoting.
Graver Corp.

Reverse Gear, Power.
Barco Mfg. Co.
Franklin Railway Supply Co., Inc.

Rivet Cutters.
Ingersoll-Rand Co.
Interstate Iron & Steel Co.

Riveters, Hydraulic.
Birdsboro Steel Foundry & Mach. Co.

Riveting Machines.
Ingersoll-Rand Co.

Rivets.
Inland Steel Co.
Neely Nut & Bolt Co.
Ryerson & Son, Joseph T.
Pressed Steel Car Co.
Russell, Burdsall & Ward Bolt and Nut Co.

Rods.
Neely Nut & Bolt Co.

Rolled Steel.
Carnegie Steel Co.

Roller Bearings (See Bearings, Roller).

Rolls, Bending & Straightening.
Birdsboro Steel Foundry & Mach. Co.

Roof Decks, Steel.
Mahon Co., R. C.

Roof Slabs, Concrete.
Federal American Cement Tile Co.

Roofing, Asbestos.
Carey & Co., Philip, The.
Lehon Co., The.
Johns-Manville Corp.

Roofing, Buildings.
American Rolling Mill Co.
Carey Co., Philip, The.
Lehon Co., The.
Johns-Manville Corp.

Roofing, Car.
American Rolling Mill Co.
American Sheet & Tin Plate Co.
Carey & Co., Philip, The.
Lehon Co., The.
Hutchins Car Rfg. Co.
Johns-Manville Corp.
Tuco Products Corp.
Union Metal Products Co.

Roofing, Corrugated.
American Rolling Mill Co.
American Sheet & Tin Plate Co.
Carey Co., Philip, The.
Johns-Manville Corp.

Roofing, Tile.
Federal American Cement Tile Co.

Roofing, Tile, Cement.
Federal American Cement Tile Co.

Roofing, Tin.
American Sheet & Tin Plate Co.

Rope, Wire — (See Wire Rope).

Rust Preventatives.
Dearborn Chemical Co.
Oakite Products, Inc.

Safe Ends.
National Tube Co.

Sand Drying Plants.
Roberts & Schaefer Co.

Sand Plants.
Railway Engineering Equipment Co.

Sanitary Products.
West Disinfecting Co.

Sash Balances.
Tuco Products Co.

Saws, Circular Metal.
Ryerson & Son, Joseph T.

Saws, High Speed, Friction.
Ryerson & Son, Joseph T.

Saws, Portable Rail.
Industrial Brownhoist Corp
Q & C Co., The.

Scales.
Fairbanks-Morse & Co.

Scrapers, Wheeled and Drag.
Western Wheeled Scraper Co.

Screens, Passenger Car.
Tuco Products Corp.

Seats, Car.
Brill Co., The J. G.
Hale-Kilburn Co.
Heywood-Wakefield Co.
St. Louis Car Co.

Seats, Coach.
Brill Co., The J. G.

Shafting.
Falls Hollow Staybolt Co.
Ryerson & Son, Joseph T.
Sellers & Co., Inc., Wm.
Standard Steel Works Co.

Shapers.
Ryerson & Son, Joseph T.

Shapes, Pressed Steel.
Pressed Steel Car Co.
Sellers & Co., Inc., Wm.

Shapes, Structural.
Bethlehem Steel Co.
Carnegie Steel Co.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Sheds, Train.
American Bridge Co.
Inland Steel Co.

Sheets, Black and Galvanized.
Allegheny Steel Co.
American Rolling Mill Co., The.
American Sheet & Tin Plate Co.
Inland Steel Co.
Republic Steel Corp.
Ryerson & Son, Joseph T.

Sheets, Blue Annealed.
Allegheny Steel Co.

Sheets, Car & Building.
American Rolling Mill Co.

Sheets, Corrugated.
American Rolling Mill Co., The.
American Sheet & Tin Plate Co.
Carey Co., Philip, The.
Carnegie Steel Co.
Johns-Manville Corp.
Ryerson & Son, Joseph T.

Sheets, Corrugated and Plain.
Inland Steel Co.
Ryerson & Son, Joseph T.

Sheets, Electrical.
American Rolling Mill Co., The.
American Sheet & Tin Plate Co.
Republic Steel Corp.
Ryerson & Son, Joseph T.

Sheets, Iron & Steel.
American Rolling Mill Co.
Bethlehem Steel Co.

Sheets, Locomotive Jacket.
American Rolling Mill Co., The.
American Sheet & Tin Plate Co.
Inland Steel Co.

Sheets, Polished or Planished. Iron.
American Rolling Mill Co., The.
American Sheet & Tin Plate Co.

Sheets, Steel.
American Rolling Mill Co., The.
Inland Steel Co.
Ryerson & Son, Joseph T.

Sherardising Plants.
General Electric Co.

Shop Calling Systems—(See Systems, Communication)

Shops, Railroad—(See Buildings, Iron, Steel and Steel Concrete).

Shovels & Draglines.
American Hoist & Derrick Co.
Industrial Brownhoist Corp.

Shovels, Gasoline & Electric.
American Hoist & Derrick Co.

Shovels, Steam, Gasoline & Electric.
American Hoist & Derrick Co.
Clark Tructractor Co.
Orton Crane & Shovel Co.

Siding, Bldg., Car, Corrugated & Plain.
Kinnear Mfg. Co.
American Rolling Mill Co.
American Sheet & Tin Plate Co.
Inland Steel Co.

Siding, Corrugated & Plain.
Carey & Co., Philip, The.
Johns-Manville Corp.

Siding, Iron & Steel.
American Rolling Mill Co.

Signal Accessories.
Electric Storage Battery Co.
General Electric Co.
General Railway Signal Co.
Graybar Electric Co.
Railroad Supply Co.
Union Switch & Signal Co.
Westinghouse Elec. & Mfg. Co.

Signals, Automatic Cab.
General Railway Signal Co.
Union Switch & Signal Co.

Signal Blades.
General Railway Signal Co.
Union Switch & Signal Co.

Signals, Crossing.
Union Switch & Signal Co.

Signals, Crossing Protection.
General Railway Signal Co.
Railroad Supply Co.

Signals, Railway.
General Electric Co.
Union Switch & Signal Co.

Signs, Highway Crossing.
Railroad Supply Co.

Silico Manganese.
Vanadium Corp. of America

Silicon.
Electro Metallurgical Sales Corp.

Slabs, Concrete Floor.
American Cement Tile Mfg. Co.
Federal Cement Tile Co.

Slag, Blast Furnace.
Carnegie Steel Co.

Slotting Machines.
Sellers & Co., Inc., Wm

Slotting Machines, Locomotive Cylinder.
American Steel & Wire Co.

Sludge Removers.
Bird-Archer Co., The.

Soap, Liquid.
West Disinfecting Co.

Snow Plows.
Jordan Co., O. F.

Solder.
National Bearing Metals Corp.
Westinghouse Elec. & Mfg. Co.

Special Machinery.
Whiting Corporation

Speed Indicators & Recorders.
Valve Pilot Corp.

Spelter—(See Zinc).

Spikes.
American Steel & Wire Co.
Bethlehem Steel Co.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Splice Bars, Angle.
Carnegie Steel Co.
Illinois Steel Co.
Inland Steel Co.

Spreaders, Ballast.
Jordan Co., O. F.

Spring, Plates or Seats.
Allegheny Steel Co.
National Malleable & Steel Castings Co.
Union Spring & Mfg. Co.

Springs.
American Steel Foundries Co.
American Steel & Wire Co.
Pittsburgh Spring & Steel Co.
Railway Steel Spring Co.
Standard Steel Works Co.
Union Spring & Mfg. Co.
Union Switch & Signal Co.

Springs, Shop Equipment.
Ryerson & Son, Joseph T.

Springs, Vanadium Steel.
Pittsburgh Spring & Steel Co.
Union Spring & Mfg. Co.

Stacks, Steel.
American Bridge Co.
Graver Corp.

Stands, Switch & Target.
Q & C Co., The.

Staybolts.
American Locomotive Co.
Ewald Iron Co.
Falls Hollow Staybolt Co.
Flannery Bolt Co.
Ryerson & Son, Joseph T.

Staybolts, Hollow.
Falls Hollow Staybolt Co.
Ryerson & Son, Joseph T.

Steam Chests.
Franklin Railway Supply Co., Inc.

Steam Enclosures, Corrugated Iron.
Republic Steel Corp.

Steam Shovels.
American Hoist & Derrick Co.
Orton Crane & Shovel Co.

Steel Alloy.
Illinois Steel Co.
Ryerson & Son, Joseph T.
Republic Steel Corp.
Standard Steel Works Co.

Steel, Firebox.
Carnegie Steel Co.
Illinois Steel Co.

Steel, Heat Treated.
Interstate Iron & Steel Co.

Steel & Iron, Stainless.
Allegheny Steel Co.

Steel, Open Hearth.
Carnegie Steel Co.
Illinois Steel Co.

Steel Plate Construction.
Graver Corp.

Steel, Pressed Specialties.
Hale-Kilburn Co.

Steel, Structural.
American Bridge Co.
Carnegie Steel Co.
Graver Corp.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Steel, Tool.
Illinois Steel Co.
Midvale Co., The.
Q & C Co., The.
Ryerson & Son, Joseph T.

Step Joints.
Q & C Co., The
Rail Joint Co.

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Trucks, Cast Steel, Electric Car
General Steel Castings Corp.

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Bethlehem Steel Co.
National Tube Co.
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Reading Iron Co.

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Falls Hollow Staybolt Co.

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Goodyear Tire & Rubber Co.

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Aluminum Co. of America.

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American Steel & Wire Co.
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Nichols & Bros., Geo. P.
Whiting Corporation.

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Industrial Brownhoist Corp.

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Whiting Corporation.

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Whiting Corporation.

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Whiting Corporation.

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Remington-Rand Business Service.

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General Steel Castings Corp.

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General Steel Castings Corp.

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Pressed Steel Car Co.
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Massachusetts Mohair Plush Co.

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Pyle-National Co.

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Westinghouse Air Brake Co.

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Oxweld Railroad Service Co., The.

Valves, Blow-Off.
Bird-Archer Co., The.

Valves, Check & Angle Steam
Sellers & Co., Inc., Wm.

Valves, Drifting.
Ardco Mfg. Co.
Sellers & Co., Inc., Wm.

Valves, Hydraulic.
Birdsboro Steel Foundry & Mach. Co.

Valves, Piston.
Franklin Railway Supply Co., Inc.

Valves, Pop, Safety & Relief.
Ashton Valve Co.
Vapor Car Heating Co., Inc.
Westinghouse Air Brake Co.

Valves, Pressure Regulating.
Gold Car Heating & Lighting Co.

Valves, Tire.
Schrader's Son, Inc., A.

Valves, Throttle.
Bradford Corporation.

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Electro Metallurgical Sales Corp.

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Aluminum Co. of America.

Varnishes.
General Electric Supply Corp.
Sherwin-Williams Co.

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Gold Car Heating & Lighting Co.
Vapor Car Heating Co., Inc.
Wine Railway Appliance Co.

Ventilators, Shop & Roundhouse.
Carey Co., Philip, The.
Johns-Manville Corp.

Wardrobes, Rolling and Disappearing Front — (See Lockers).

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National Malleable & Steel Castings Co.
Reliance Mfg. Co.
Ryerson & Son, Joseph T.
Wine Railway Appliance Co.

Washers, Boiler.
Sellers & Co., Inc., Wm.

Washers, Lock.
Reliance Manufacturing Co., The.

Washers, Railway Car.
Whiting Corporation.

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Lehon Co., The.
Johns-Manville Corp.

Water Purifying Materials & Compounds.
Bird-Archer Co., The.
Dearborn Chemical Co.

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Dearborn Chemical Co.
Graver Corp.

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Tuco Products Corp.

Wedges, Automatic.
Franklin Railway Supply Co., Inc.

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Gould Coupler Co.
National Malleable & Steel Castings Co.
Pressed Steel Car Co.
Steel Car Forge Company.
Symington Co., The.

Weed Killer.
Q & C Co., The.

Welding Equipment.
Clark Tructractor Co.

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Welding Machines, Flue.
Ryerson & Son, Joseph T.

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Oxweld Railroad Service Co.
Franklin Railway Supply Co., Inc.

Welding Process.
Oxweld Railroad Service Co.

Welding Rods.
American Steel & Wire Co.
General Electric Supply Corp.
Oxweld Railroad Service Co., The.
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Welding Supplies.
General Electric Co.
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Armco Culvert Mfrs. Assoc.
Republic Steel Corp.

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American Steel Foundries.
Baldwin Locomotive Works.
Birdsboro Steel Foundry & Mach. Co.
Edgewater Steel Co.
Hunt-Spiller Mfg. Corp.
Standard Steel Works Co.
Union Steel Casting Co.

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American Locomotive Co.
American Steel Foundries.
Baldwin Locomotive Works.
Bethlehem Steel Co.
Carnegie Steel Co.
Edgewater Steel Co.
Illinois Steel Co.
Mt. Vernon Car Mfg. Co.
Pressed Steel Car Co.
Railway Steel Spring Co.
Standard Steel Works Co.

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Assn. of Mfrs. of Chilled Car Wheels.
Graybar Electric Co.
Griffin Wheel Co.
Mt. Vernon Car Mfg. Co.
Pressed Steel Car Co.

Wheels, Mine Car.
Carnegie Steel Co.
Edgewater Steel Co.
Mt. Vernon Car Mfg. Co.
Standard Steel Works Co.

Wheels, Passenger Car.
Carnegie Steel Co.
Illinois Steel Co.
Edgewater Steel Co.
Pullman Car & Mfg. Corp.
Standard Steel Works Co.

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American Locomotive Co.
American Steel Foundries.
Carnegie Steel Co.
Edgewater Steel Co.
Illinois Steel Co.
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Windows, Locomotive Cab, Clear Vision.
Prime Manufacturing Co.

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General Cable Corp.
Kerite Insulated Wire & Cable Co.
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Wire, Fence.
American Steel & Wire Co.

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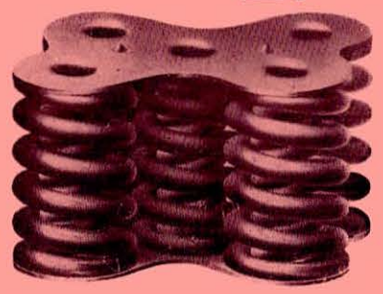
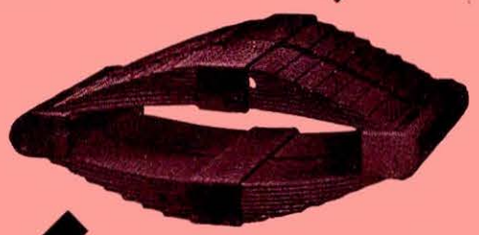
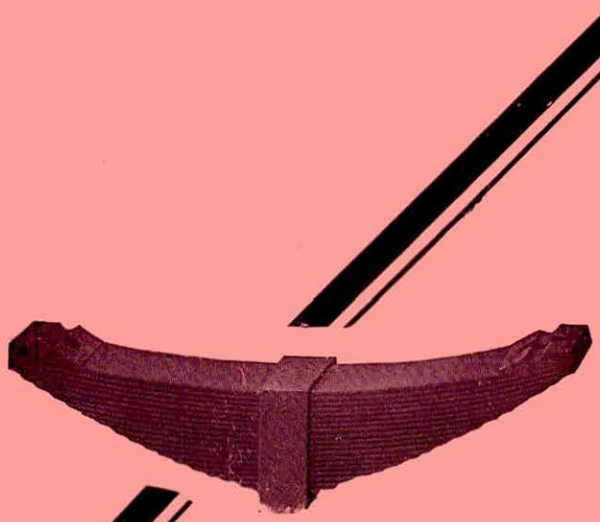
Merely Keeping Busy Is Not Good Business







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The repair of broken springs should receive the same skillful attention as the manufacture of new ones. Much of the misalignment of locomotive equalizing mechanisms is due to poor and non-uniform springs. Without adequate equipment, skilled labor, a volume in tonnage and a complete, well-rounded organization it is impossible to repair springs properly and economically.

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Railway Steel-Spring Company

30 CHURCH ST., NEW YORK

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		Cleveland, Ohio		

SIGNALING PROGRESS IN 1930*

"The volume of signaling installations completed during 1930 was about nine per cent in excess of the previous year and considerably above that for 1927, the previous peak year in terms of miles of road equipped with automatic block.

"As a matter of fact, the miles of road signaled in 1930 was 20 per cent less than in 1929 and 28 per cent less than in 1927. However, the increased popularity of remote power-operated switches with centralized control for directing train movements has been an important factor in maintaining the total volume of expenditures in the signal field. Likewise, interlocking programs exceeded those of the previous year, as did also the installation of automatic highway crossing signals.

"Because of changed conditions, the mileage of line equipped with new signaling can no longer be used as the most important gage of activity in the signaling field. Although there are thousands of miles of important lines yet to be signaled, nevertheless a greater volume of apparatus is being installed on lines which have been signaled for years. These improvements include not only the replacement of old automatic signals, but also cab signaling, train control, new interlockings, remote and centralized control systems and car retarders."

*Excerpt from **Railway Age**, Annual Statistical Number, page 4.

UNION SWITCH & SIGNAL COMPANY
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Rochester, N. Y.

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Signals Aid Modern Motive Power to Move More Ton-Miles Per Freight Train-Hour